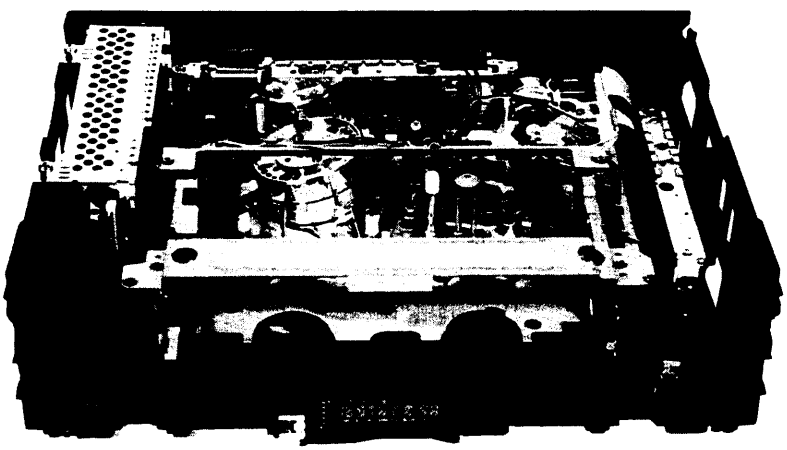
Mechanism Service Technical Information

Video Cassette Recorder

THORN

TEUKR Part No. TP30036

VR182LV
VR194LV
VR204NV



VHS
PAL

Contents

1. **MAIN MECHANISM PARTS LOCATIONS**
   - 1-1. MECHANISM ASS'Y (TOP VIEW) 3
   - 1-2. MECHANISM ASS'Y (BOTTOM VIEW) 4
   - 1-3. FRONT LOADING MECHANISM 5

2. **MECHANISM DISMANTLING AND REASSEMBLING** 6
   - 2-1. MECHANISM MAIN UNIT 6
   - 2-2. CASSETTE MECHANISM ASS'Y 7
   - 2-3. COMPL MOTOR BRACKET (LOADING MOTOR BLOCK) 13
   - 2-4. TAPE LOADING MECHANISM 16
   - 2-5. COMPL HEAD BRACKET (ACE HEAD) 19
   - 2-6. PINCH ROLLER PRESSURE MECHANISM 20
   - 2-7. BRAKE MECHANISM 22
   - 2-8. REEL TABLE DRIVE MECHANISM 26
   - 2-9. CAPSTAN MOTOR 32
   - 2-10. FIXED GUIDE, FE HEAD LEVER ASS'Y 33
   - 2-11. DRUM SECTION 36
   - 2-12. AUTO HEAD CLEANING MECHANISM 41
   - 2-13. HOW TO PROCEED WHEN THE CASSETTE CANNOT BE REMOVED 42

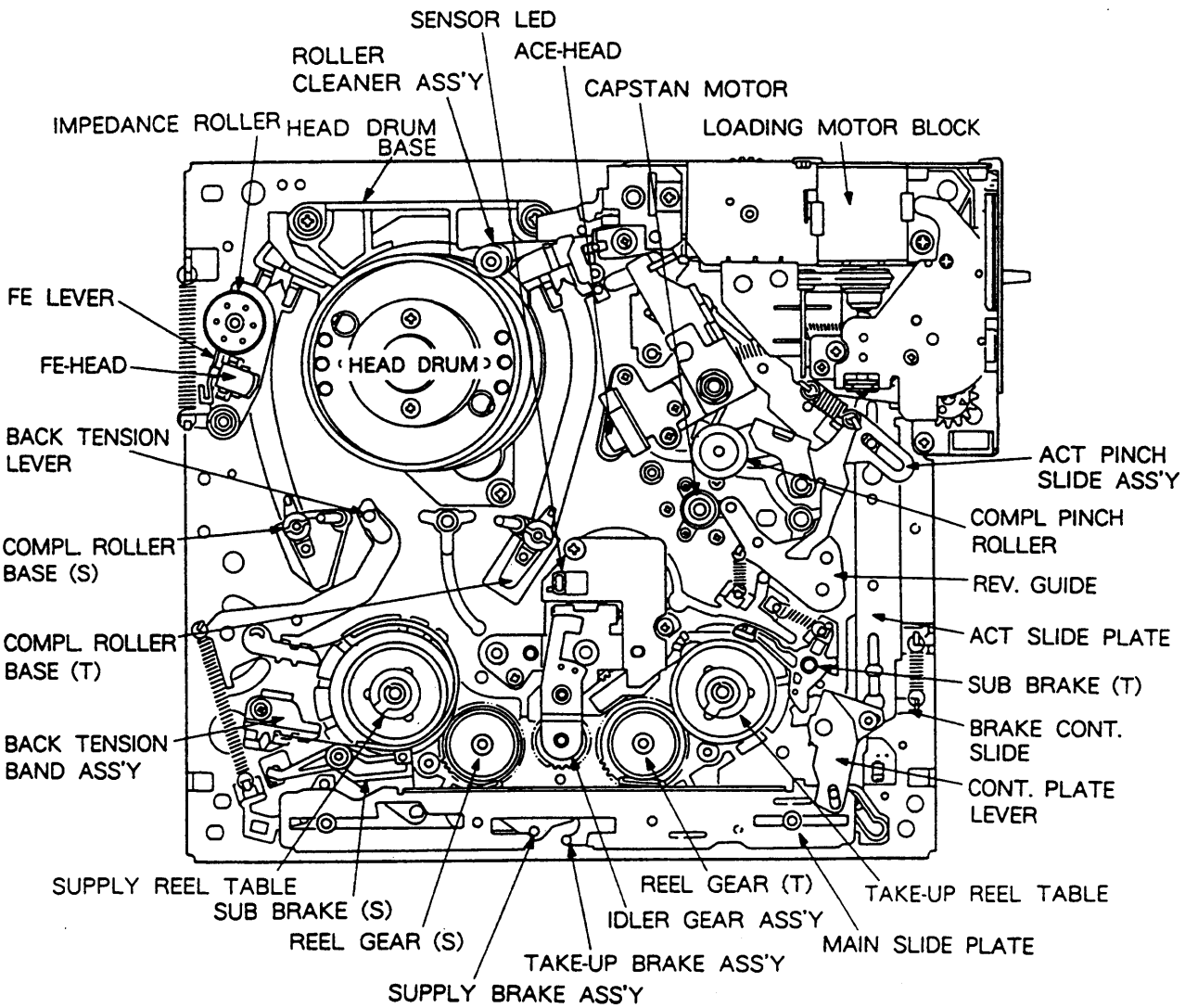
3. **MECHANISM MAINTENANCE AND CHECKING** 43
   - 3-1. PERIODIC CHECKING AND MAINTENANCE ITEMS AND SERVICE JIGS 43
   - 3-2. MODE SELECTOR (VHJ-0050) HANDLING INSTRUCTIONS 46

4. **MECHANISM ADJUSTMENT** 49
   - 4-1. OPERATING THE MECHANISM WITH NO CASSETTE INSERTED 49
   - 4-2. REEL TABLE HEIGHT ADJUSTMENT AND TORQUE CHECK 50
   - 4-3. TENSION POLE (BACK TENSION GUIDE) POSITION ADJUSTMENT AND BACK TENSION TORQUE CHECK 52
   - 4-4. TAPE PATH ADJUSTMENT 53

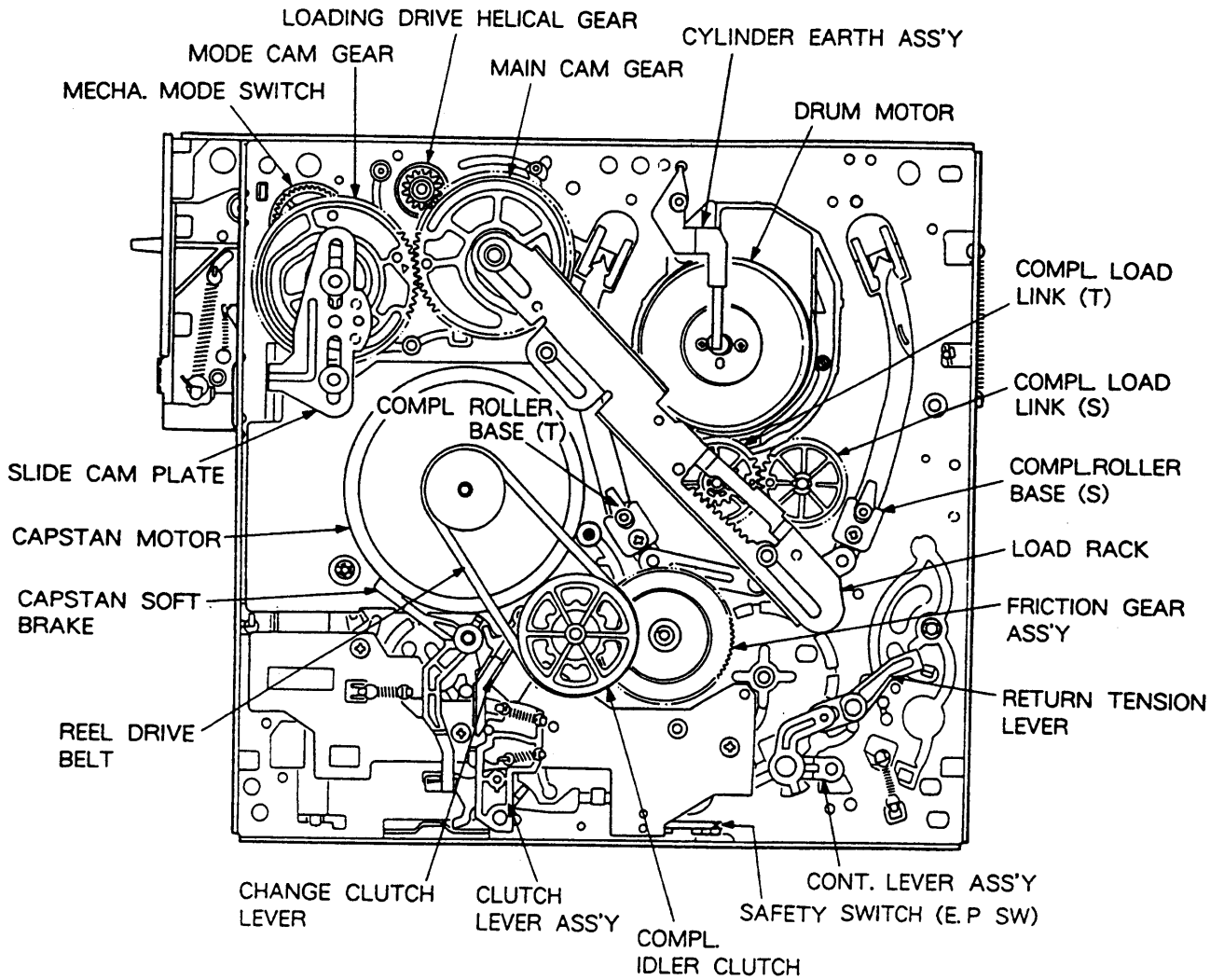
1. MAIN MECHANISM PARTS LOCATIONS

1-1. MECHANISM ASS'Y (Top View)

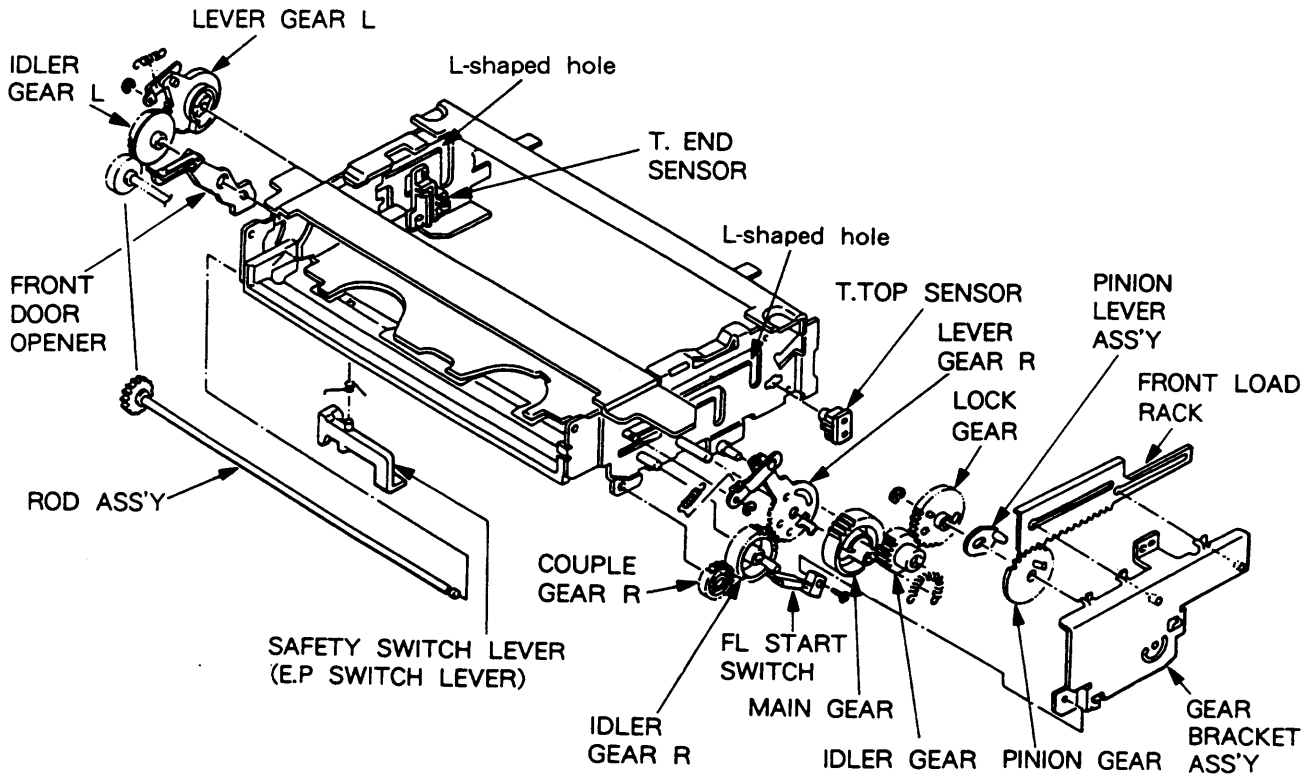
Note: Some models do not have the impedance roller.



1-2. MECHANISM ASS'Y (Bottom View)



1-3. FRONT LOADING MECHANISM



2. MECHANISM DISMANTLING AND REASSEMBLING

2-1. MECHANISM MAIN UNIT (See Fig. 2-1-1.)

1. Removal

1) Remove the connectors of the COMPL MC-3 and the COMPL HEAD BRACKET.
2) Remove the flexible cable ① connecting the COMPL CYLINDER to the COMPL VP-1 ③. (See Fig. A.)
3) Remove the two screws ②, then remove the COMPL VP-1 ③.
4) Remove the two screws ④, then remove the PRE-AMP BRACKET ⑤.
5) Remove the two screws ⑥.
6) Remove the two screws ⑦ and two screws ⑩, then lift up the mechanism main unit and remove it.
   Since the TRAY ⑧ obstructs removal of the two front screws ⑩, move the TRAY LOCK LEVER ⑨ in the direction of the arrow to unlock the tray, then slide off the TRAY ⑧ before removing the screws. (See Fig. B)

Note: The shape of the COMPL VP-1 ③ and the PRE-AMP BRACKET ⑤ differ depending on the model.

2. Remounting

1) Mount the mechanism main unit onto the chassis with the three screws ⑦ and two screws ⑩.
2) Tighten the two screws ⑥.
3) Mount the PRE-AMP BRACKET ⑤ with the two screws ④.
4) Mount the COMPL VP-1 ③ and the ground lug with the two screws ②. (Some models are not provided with a ground lug.)
5) Insert the flexible cable ① into the connector of the COMPL VP-1.
6) Connect the connectors of the COMPL MC-2 and COMPL HEAD BRACKET.

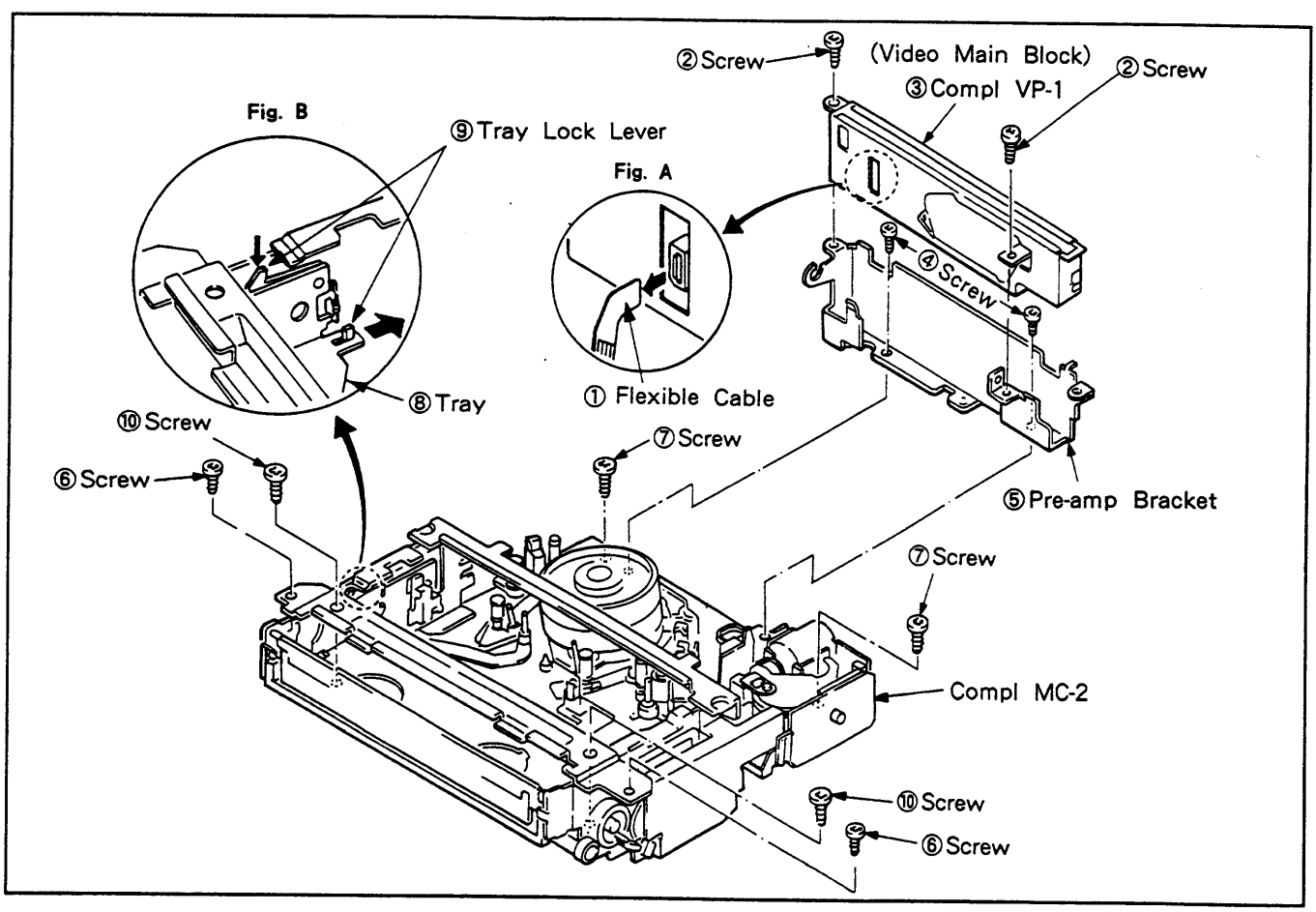


Fig. 2-1-1. Mechanism Main Unit

2-2. CASSETTE MECHANISM ASS'Y

2-2-1. CASSETTE MECHANISM (See Fig 2-2-1.)

1. Removal

1) Set the video main unit to the EJECT completed mode.
2) Pull out the connectors (6-PIN CONNECTOR connected to the system control circuit board, ACE HEAD CONNECTOR, and FTE HEAD CONNECTOR) from the CASSETTE HOLDER.
3) Remove the two screws ①.
4) Remove the two screws ②.
5) Lift up the COMPL CASSETTE MECHANISM ④, push it back a little and remove the two hooks ③ on the front. (See Fig. B.) When doing so, be sure that the SAFETY SWITCH LEVER is not caught by the mechanism chassis.

2. Remounting

1) Set the chassis section mechanism to the EJECT mode with the mode selector (VHJ-0050) (looking from the top, align the EJECT mode positioning alignment hole ⑤ to the MOTOR HOLDER hole ⑥ as shown in Fig. A).
2) Set the COMPL CASSETTE MECHANISM ④ to the EJECT completed mode.
3) Mount the COMPL CASSETTE MECHANISM ④ onto the mechanism chassis, aligning it with the protuberance.
   Align the EJECT mode positioning alignment mark ⑧ to the △ positioning alignment mark ⑦. (See Fig. A)
4) Attach to the mechanism chassis with the two screws ②.
5) Attach to the chassis with the two screws ①.
6) Connect the various connectors.

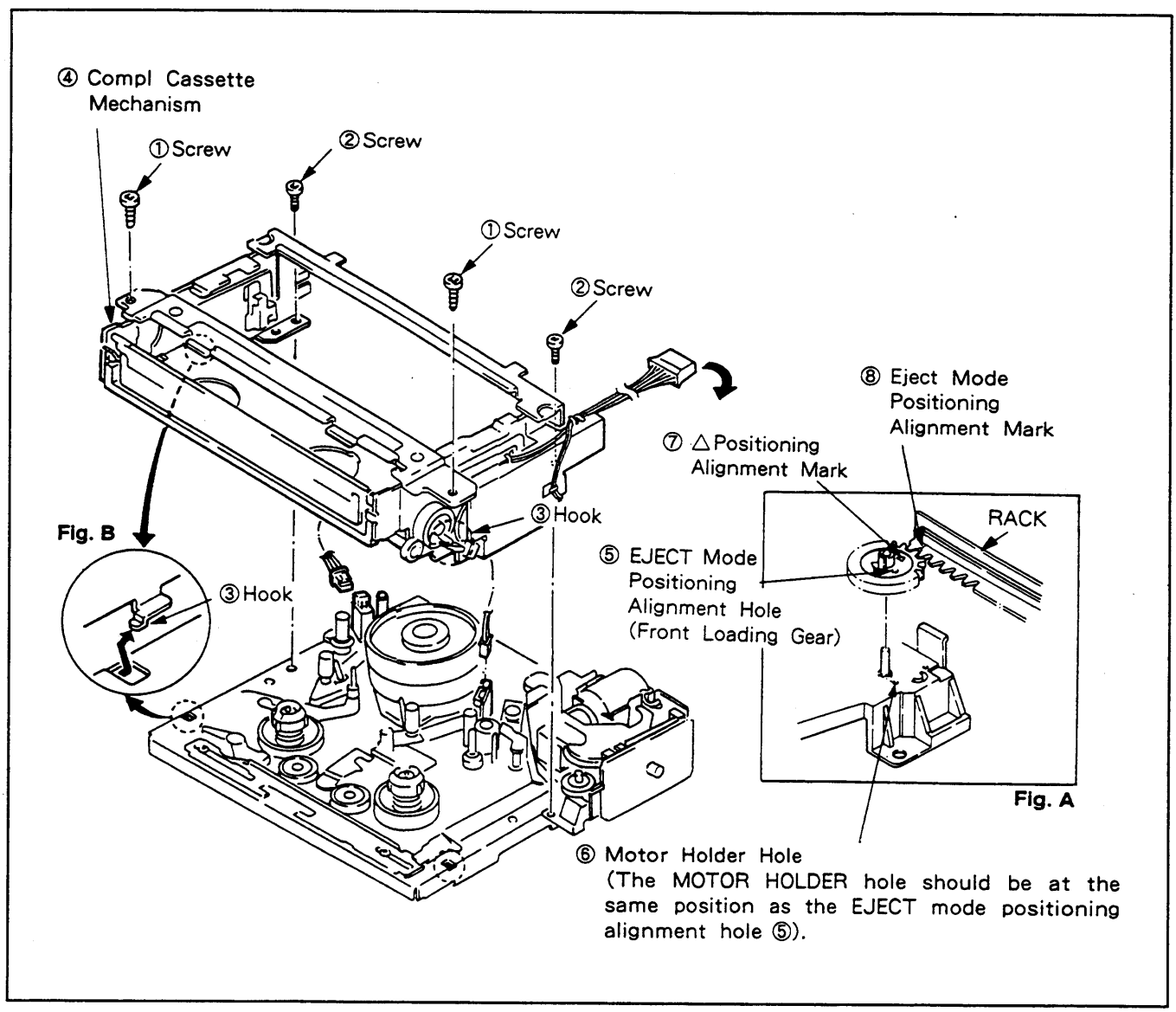


Fig. 2-2-1. Cassette Mechanism

2-2-2. GEAR BRACKET ASS'Y (See Fig. 2-2-2.)

1. Removal

1) Remove the COMPL CASSETTE MECHANISM as instructed in 2-2-1.
2) Remove the three screws ①, then remove the GEAR BRACKET ASS'Y ② as shown in Fig. A.
3) Remove the E-ring ③, then remove the LOCK GEAR ④, the PINION LEVER ASS'Y ⑤, the PINION GEAR ⑥ and the RACK ⑦, in that order.

2. Remounting

1) Apply grease to the shaft ⑧ and the two pins ⑨ of the GEAR BRACKET ASS'Y.
2) Apply grease to the pin ⑩ of the PINION LEVER ASS'Y.
3) Apply grease to the toothed part of the RACK ⑦.
4) Fit the RACK ⑦ onto the two pins ⑨. Align the positioning alignment hole ⑪ to the positioning alignment hole ⑫ of the GEAR BRACKET.
5) Mount the PINION GEAR ⑥, PINION LEVER ASS'Y ⑤, and LOCK GEAR ④ in the shaft ⑧ in the order mentioned.
   Align the positioning alignment holes ⑬ of the PINION GEAR and the LOCK GEAR with the positioning alignment hole ⑪ of the RACK at the same time.
6) Mount the E-ring ③ onto the shaft ⑧.
7) Set the GEAR BRACKET ASS'Y ② onto the dowel and mount it using three screws ①.
   Align the positioning alignment hole Ⓐ of the IDLER GEAR with the positioning alignment hole Ⓑ of the SIDE BOARD as shown in Fig. 2-2-3 at this time.
   Also align the positioning alignment holes ⑬ of the PINION GEAR and the LOCK GEAR with the positioning alignment hole ⑫ of the GEAR BRACKET by referring to Fig. 2-2-2. After mounting them, check to be sure that the FL START SWITCH ⑭ is in the ON position as shown in Fig. A.
8) Remount the COMPL CASSETTE MECHANISM as instructed in 2-2-1.

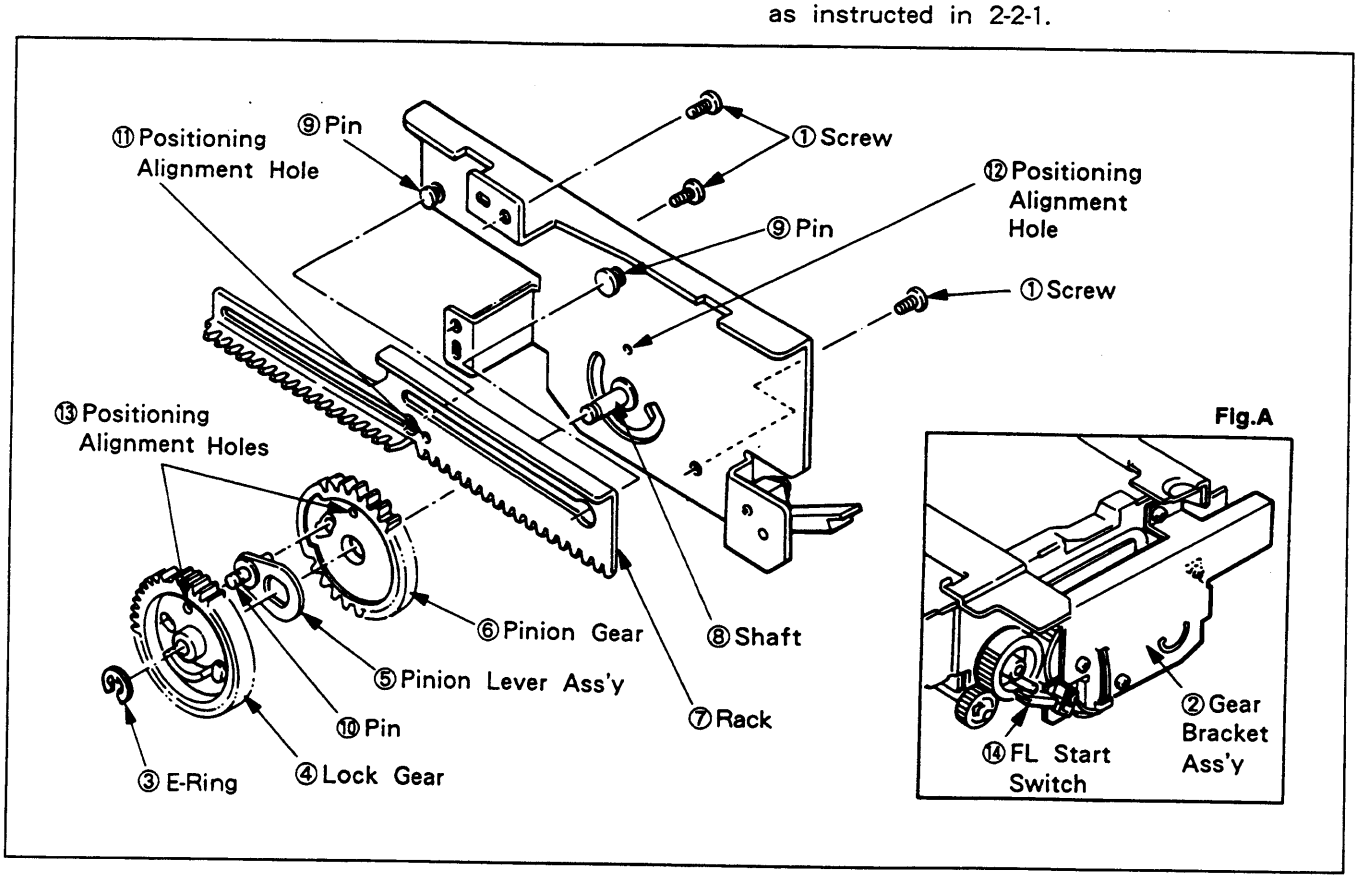


Fig. 2-2-2. Gear Bracket Ass'y

2-2-3. CASSETTE DRIVE GEAR (RIGHT) (See Fig. 2-2-3.)

1. Removal

1) Remove the COMPL CASSETTE MECHANISM and the GEAR BRACKET ASS'Y as instructed in sections 2-2-1 and 2-2-2, respectively.
2) Remove the IDLER GEAR ①.
3) Remove the SPRING COIL ②, then remove the MAIN GEAR ③.
4) Remove the E-ring ④, then remove the LEVER GEAR ASS'Y R ⑤.

2. Remounting

1) Apply grease to the gear parts that undergo friction.
2) Align the positioning alignment hole Ⓐ of the IDLER GEAR ⑧ with the positioning alignment hole Ⓑ of the SIDE BOARD.
3) Mount the LEVER GEAR ASS'Y R ⑤ onto the axles ⑪ and ⑫. Align with the IDLER GEAR ⑧ as shown in Fig. A.
4) Mount the E-ring ④ onto the axle ⑫.
5) Mount the MAIN GEAR ③ onto the axle ⑪. When doing so, align it with the IDLER GEAR ⑧ as shown in Fig. A.
6) Hook the SPRING COIL ② to the notch ⑬ in the MAIN GEAR ③ and the LEVER GEAR ASS'Y R.
7) Mount the IDLER GEAR ① onto the axle ⑭. When doing so, align it with the MAIN GEAR as shown in Fig. A.
8) Mount the GEAR BRACKET ASS'Y and the COMPL CASSETTE MECHANISM as instructed in 2-2-2 and 2-2-1, respectively.

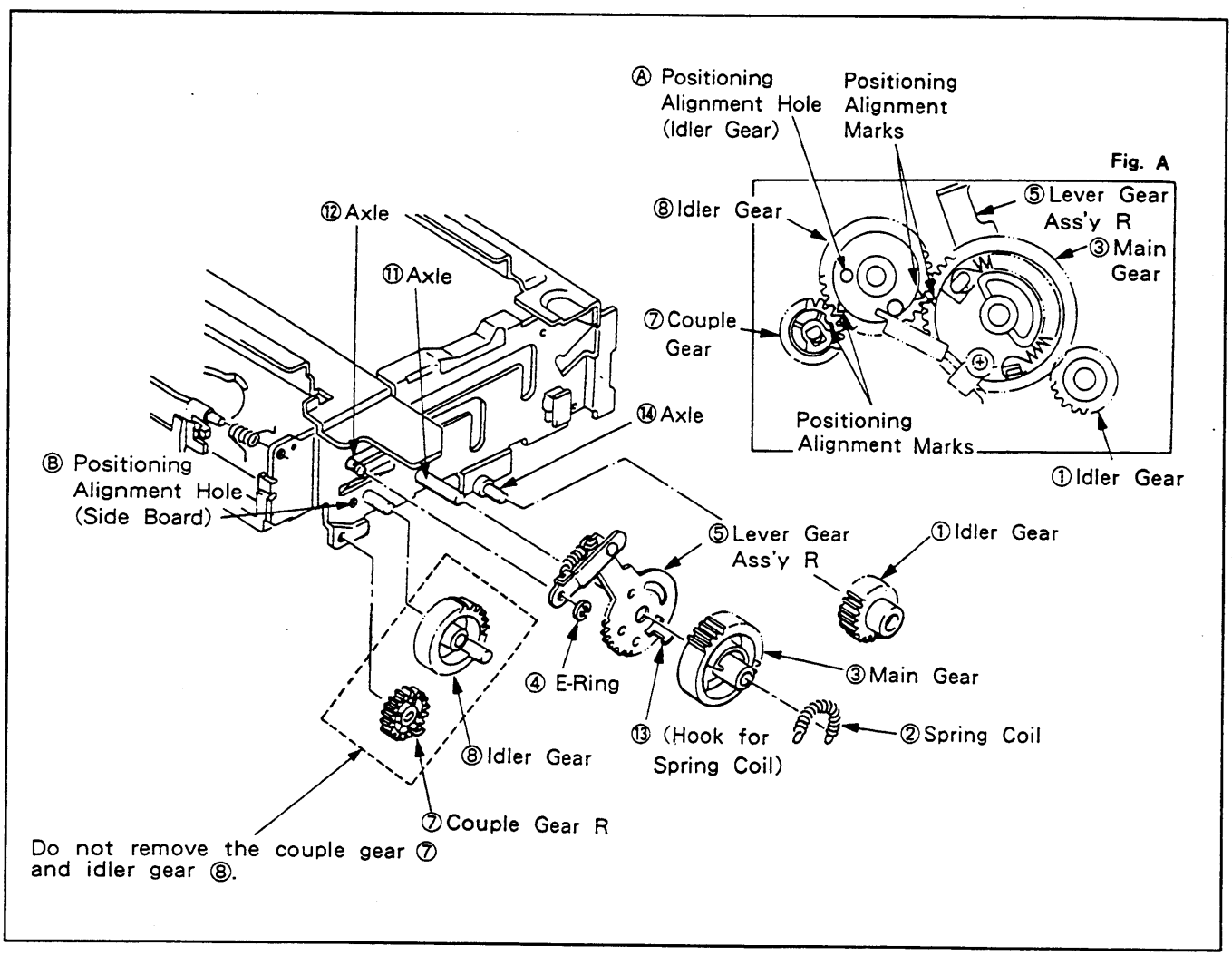


Fig. 2-2-3. Cassette Drive Gears (Right Side)

2-2-4. CASSETTE DRIVE GEAR (LEFT) (See Fig. 2-2-4)

1. Removal

1) Remove the COMPL CASSETTE MECHANISM as instructed in 2-2-1.
2) Remove the E-ring ②.
3) Open the hook ③, then remove the LEVER GEAR ASS'Y L ④. Take care not to open the hook ③ too much because it may get deformed or broken. If it does, replace it.
4) Remove the SPRING COIL ⑤ from the LEVER GEAR ASS'Y L ④.

2. Remounting

1) Apply grease to the axle ⑨ and shaft ⑩.
2) Align with the COUPLE GEAR L ⑬ and the IDLER GEAR L ⑥ as shown in Fig B.
3) Hook the SPRING COIL ⑤ to the LEVER GEAR ASS'Y L ④.
4) Mount the LEVER GEAR ASS'Y L ④ onto the axle ⑨ and the shaft ⑩. Align with the IDLER GEAR L ⑥ as shown in Fig. B.
5) Mount the COMPL CASSETTE MECHANISM onto the chassis as instructed in 2-2-1.

Note: The end of the DOOR OPEN LEVER ⑦ leans against the front side of the CASSETTE DOOR ⑪ as shown in Fig. A.

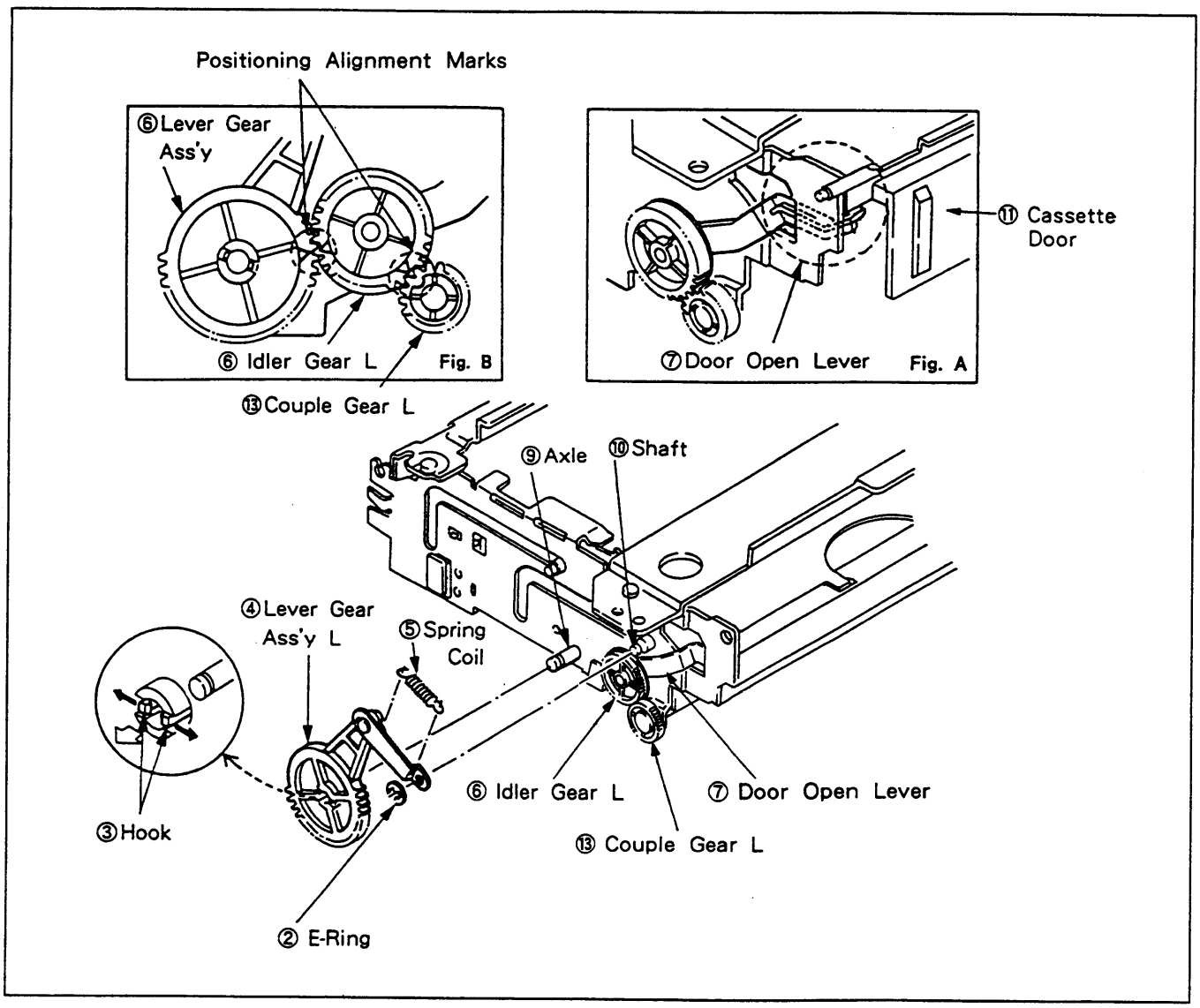


Fig. 2-2-4. Cassette Drive Gears (Left Side)

2-2-5. FL START SWITCH (See Fig. 2-2-5.)

1. Removal

1) Remove the COMPL CASSETTE MECHANISM as instructed in 2-2-1.
2) Remove the screw ①.
3) Remove the lead wire of the FL START SWITCH ②.

2. Remounting

1) Solder the lead wire to the FL START SWITCH ② terminal.
2) Align the FL START SWITCH ② protuberance to the hole ⑤, then mount it onto the GEAR BRACKET ASS'Y ③ with the screw ①. Do it so that the FL START SWITCH ② is turned ON by holding the pin ④ of the IDLER GEAR in the EJECT completed mode.
3) Mount the COMPL CASSETTE MECHANISM as instructed in 2-2-1.

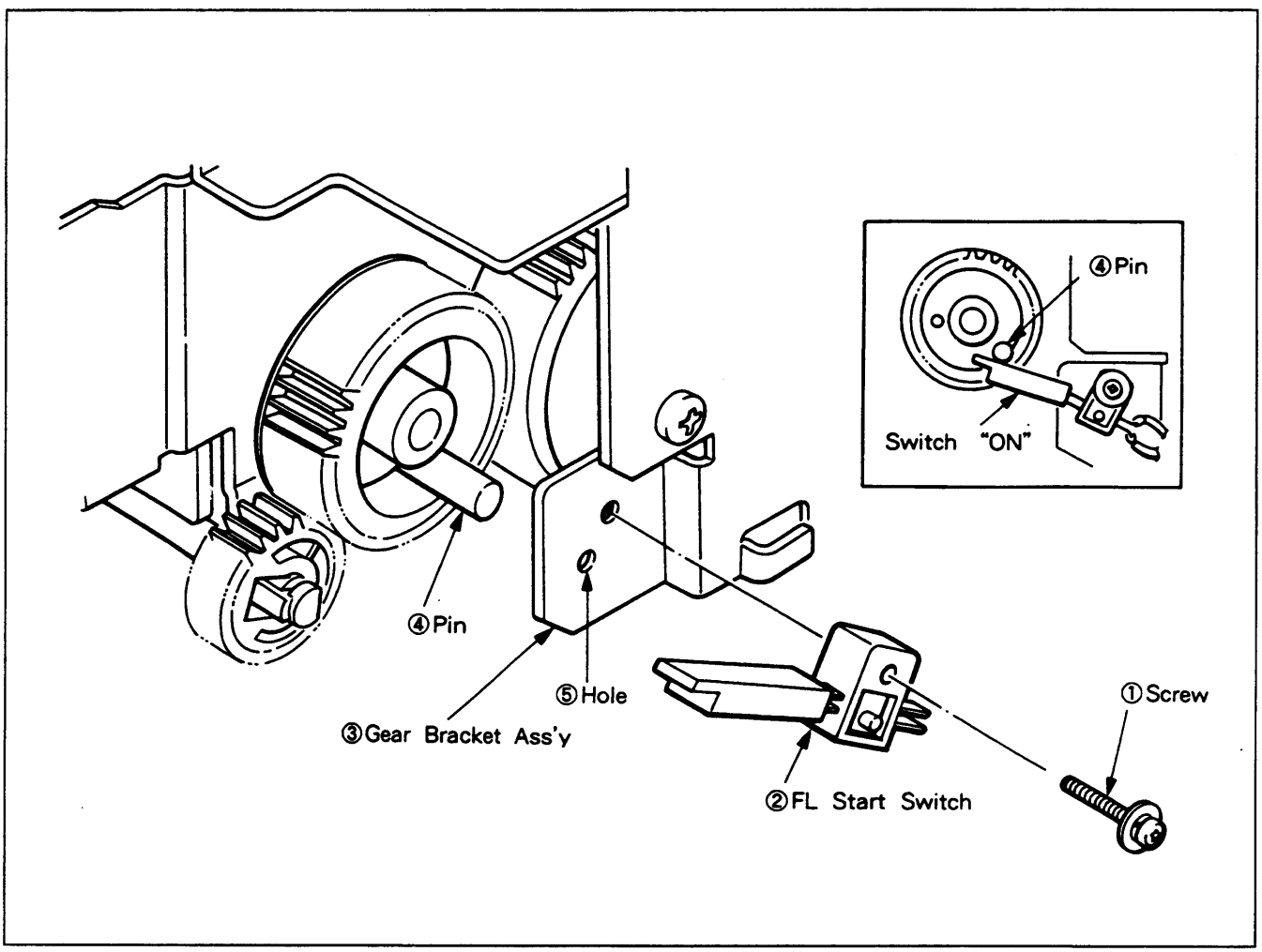


Fig. 2-2-5. FL Start Switch

2-2-6. T-TOP SENSOR, T-END SENSOR (See Fig. 2-2-6.)

1. Removal

1) Remove the COMPL CASSETTE MECHANISM as instructed in 2-2-1.
2) When removing the T-TOP SENSOR, remove the GEAR BRACKET ASS'Y as instructed in 2-2-2.
3) Unhook the hook ① as instructed in Fig. A, then remove the LID ②. Take care not to push the hook ① too much because it may get deformed or broken.
4) Remove the photo transistors ③, then remove the lead wires.

Note: Mounting position of the transistor holder on the T-END SENSOR side is precisely adjusted at the factory, so never remove it from the COMPL CASSETTE MECHANISM.

2. Remounting

1) Solder the brown lead wire to the emitter side, and the red lead wire to the collector side of the T-TOP SENSOR photo transistor ③.
   Solder the orange lead wire to the emitter side, and the yellow lead wire to the collector side of the T-END SENSOR photo transistor.
2) Mount the photo transistors ③ onto their respective holders.
3) Mount the LID ② and secure it with the hook ①.
4) Mount the GEAR BRACKET ASS'Y as instructed in 2-2-2.
5) Mount the COMPL CASSETTE MECHANISM as instructed in 2-2-1.

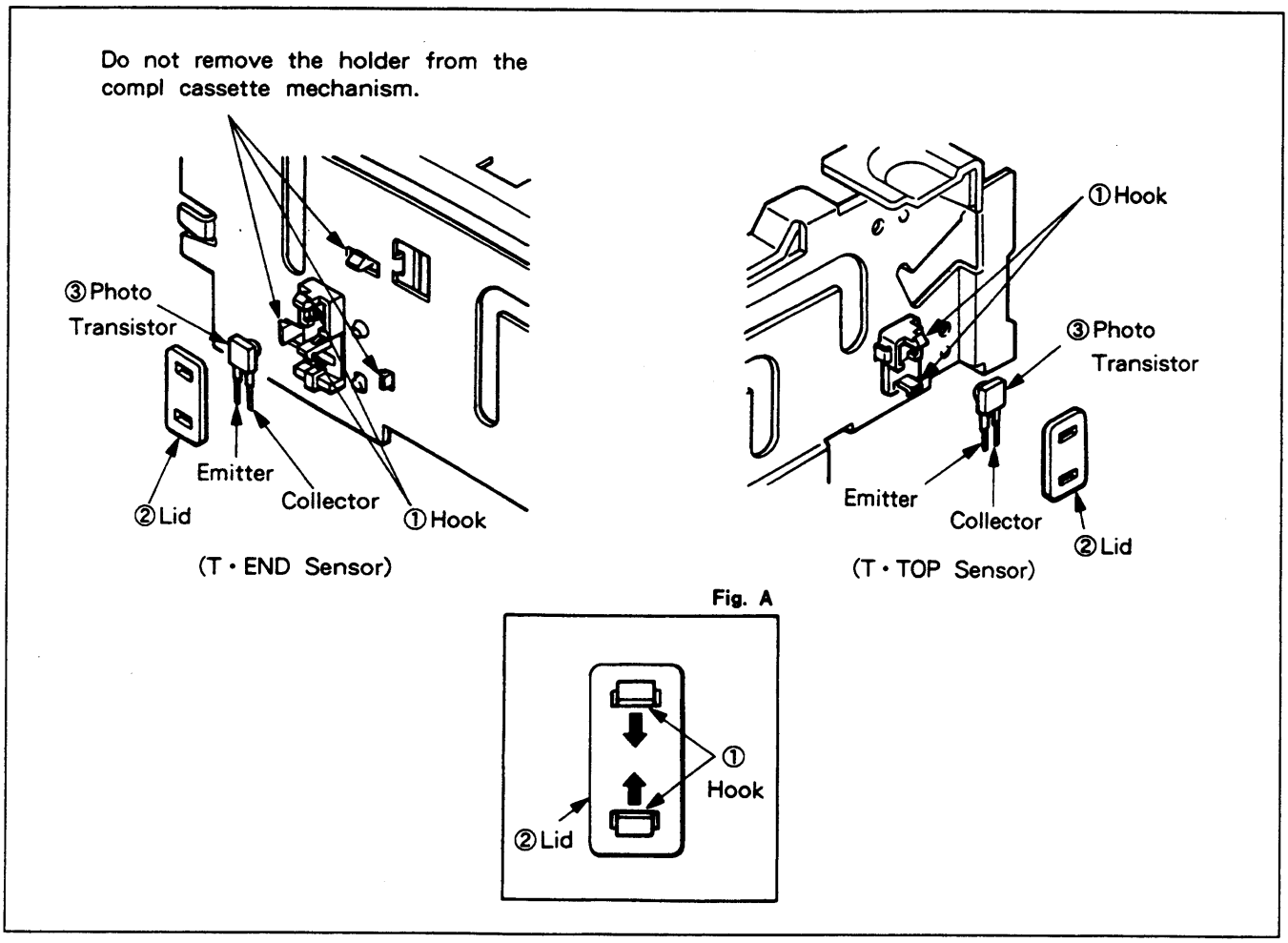


Fig. 2-2-6. T TOP Sensor & T END Sensor

2-3. COMPL MOTOR BRACKET (LOADING MOTOR BLOCK)

2-3-1. COMPL MOTOR BRACKET (See Fig. 2-3-1.)

1. Removal

1) Remove the COMPL VP-1 and the PRE-AMP BRACKET as instructed in 2-1.
2) Remove the COMPL CASSETTE MECHANISM as instructed in 2-2-1.
3) Remove the two screws ① and the other one ⑩, then remove the COMPL MOTOR BRACKET ②. (See Fig. 2-3-1.)

2. Remounting

1) Set the mechanism chassis to the INITIAL mode. In this mode, look at the mechanism chassis INITIAL mode positioning alignment holes ③ from above and align the MAIN CAM ④ and the MODE CAM ⑤ INITIAL mode positioning alignment holes as shown in Fig. A.
2) Set the COMPL MOTOR BRACKET ② to the INITIAL mode with the mode selector (VHJ-0050). In this position, the FRONT LOADING GEAR △ positioning alignment mark ⑥ is aligned with the COMPL MOTOR BRACKET INITIAL mode positioning alignment mark ⑦. (See Fig. B.)
3) Align the ROTARY SWITCH (mode detector switch) ⑧ with the INITIAL mode positioning alignment mark ⑨. (See Fig. C.)
4) Line up COMPL MOTOR BRACKET ② with PROTUBERANCE ⑪ and POSITIONING ALIGNMENT HOLE ⑫, and attach with two screws ① and one screw ⑩. (Refer to Fig. 2-3-1.)
5) Mount the COMPL CASSETTE MECHANISM as instructed in 2-2-1.
6) Mount the COMPL VP-1 and the PRE-AMP BRACKET as instructed in 2-1.

Note: Normal mechanism operation cannot be achieved if INITIAL mode positioning of the MAIN CAM ④, the MODE CAM ⑤ and the ROTARY SWITCH (mode detector switch) ⑧ are not performed precisely.

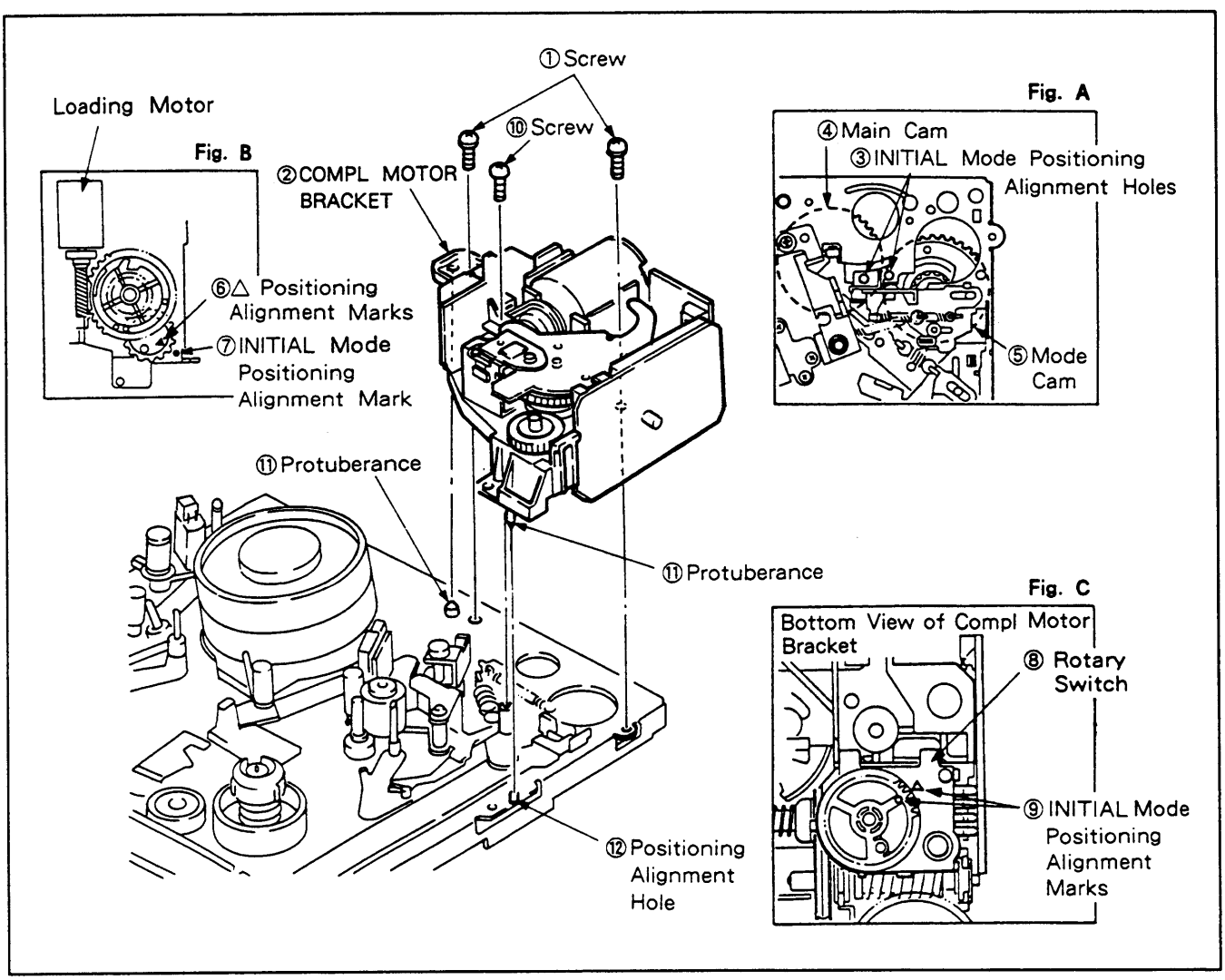


Fig. 2-3-1. Compl Motor Bracket

2-3-2. LOADING MOTOR (See Fig. 2-3-2.)

1. Removal

1) Use the MODE SELECTOR (VHJ-0050) to set the mechanism to the INITIAL mode.
2) Remove the three screws ② and remove the HOLDER BRACKET ④ with the FRONT WORM ASS'Y ③ still attached.
3) Remove the DAMPER ⑥ attached to the pulley of the LOADING MOTOR ⑤.
4) Remove the FRONT HELICAL GEAR ⑦.
5) Remove the soldered LEAD WIRE from the terminal of the LOADING MOTOR ⑤.
6) Remove the LOADING BELT ⑨.
7) Remove the LOADING MOTOR ⑤ by lifting it up from the back.

2. Remounting

Before attaching the LOADING MOTOR ⑤ to the MOTOR HOLDER ⑩, that confirm the DAMPER ⑪ and the DAMPER ⑫ shown in Fig. 2-3-2. are in the proper position on the MOTOR HOLDER ⑩.

1) The LOADING MOTOR ⑤ puts the protuberance ㉓ in the slit ㉔ of the MOTOR HOLDER ⑩. Further, mount the tap hole ⑬ at two points on the front pulley side so that it is secured to the PROTUBERANCE ⑭ of the MOTOR HOLDER at two points.
2) Solder the lead wire from the MC-3 board to the LOADING MOTOR ⑤ terminal. (Solder the red lead wire to the positive terminal side.)
3) Hang the LOADING BELT ⑨ on the pulley.
4) After hanging the LOADING BELT ⑨ on the pulley, confirm that the mechanism unit is in the INITIAL mode. The INITIAL mode is indicated by Fig. A of Fig. 2-3-2., and is the position in which INITIAL mode positioning alignment holes of the MAIN CAM ⑮ and MODE CAM ⑯ are lined up with the THROUGH HOLE ⑰ of the MOTOR HOLDER. If the INITIAL mode is not selected, use the MODE SELECTOR (VHJ-0050) to make the required adjustment.
5) As shown in Fig. B, confirm the positions of the △ INITIAL mode positioning alignment mark ⑱ on the FRONT LOAD GEAR and the INITIAL mode positioning alignment mark ⑲ of the MOTOR HOLDER, as well as the position relationship of the RACK ⑳.
6) Apply a light coat of grease to all sides of the AXLE ㉑ and the FRONT HELICAL GEAR ⑦.
7) Attach the FRONT HELICAL GEAR ⑦ to the AXLE ㉑. As shown in Fig. C, the FRONT HELICAL GEAR ⑦ is attached so that the indent on the side is inside PIN ㉒ of the FRONT LEVER ASS'Y.
8) Attach the DAMPER ⑥ to the LOADING MOTOR ⑤ pulley.
9) The HOLDER BRACKET ④ is attached by engaging the FRONT WORM ASS'Y ③ with the LOADING MOTOR ⑤ pulley, and held in place with three screws ②.
10) Return the mechanism to the eject mode completion position using the MODE SELECTOR.

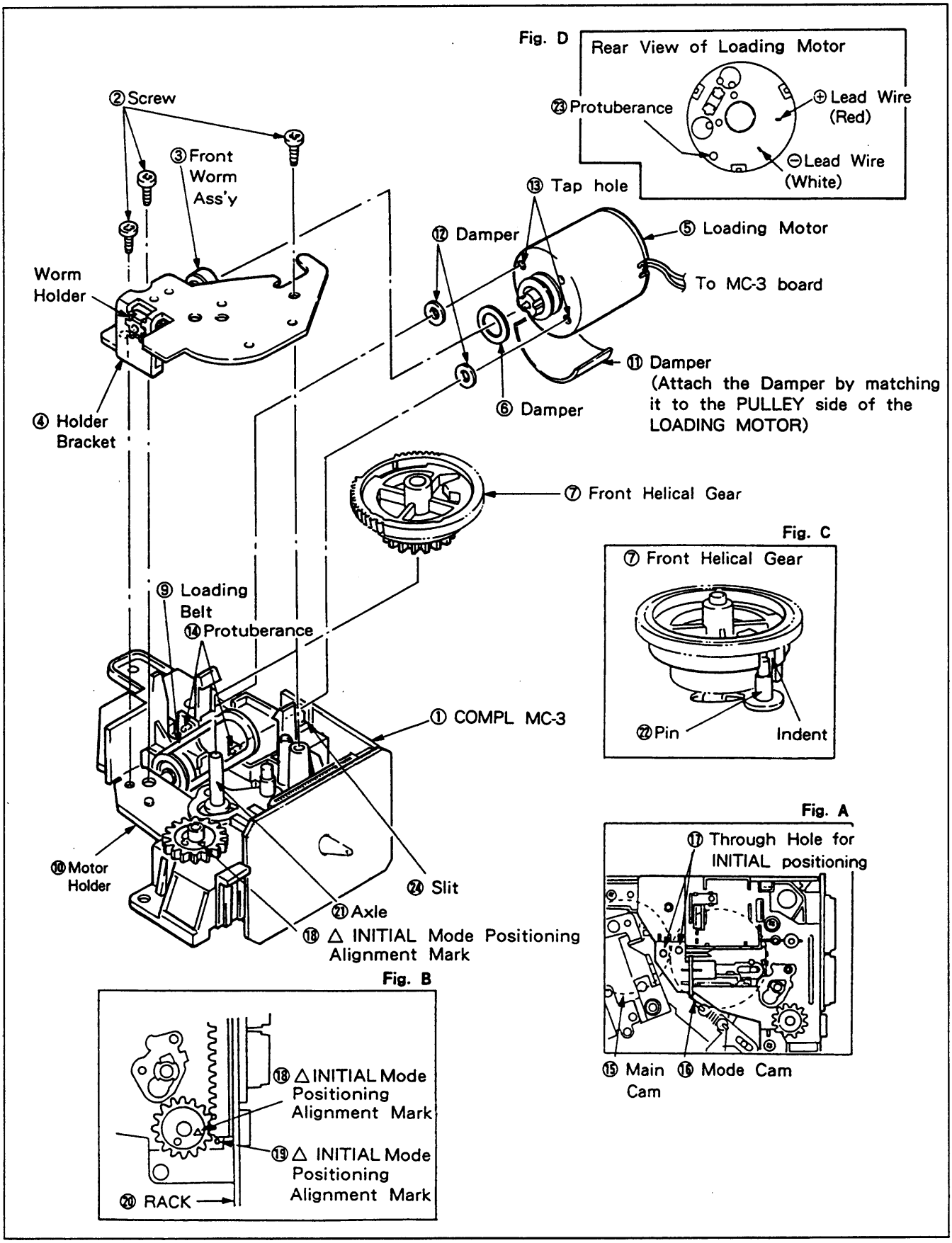


Fig. 2-3-2. Loading Motor

2-4. TAPE LOADING MECHANISM

2-4-1. MAIN PARTS OF THE TAPE LOADING MECHANISM (See Fig. 2-4-1.)

1. Removal

1) Remove connectors from the DRUM MOTOR board (SV-5).
2) Remove the three screws ①, then remove the REINFORCE BRACKET ②.
3) Remove the three special washers ③ and ⑦, then remove the spacer ⑥, LOAD RACK ④ and MAIN CAM ⑧.
4) Unhook the LOAD GEAR T hook ⑩, then remove the LOAD GEAR T ⑨ as shown in Fig. A, with the SPRING COIL ⑪ and the LOAD LEVER ASS'Y T ⑫ attached to it.
5) Unhook the LOAD GEAR S hook ⑭, then remove the LOAD GEAR S ⑬ as shown in Fig. B, with the SPRING COIL ⑮ and the LOAD LEVER ASS'Y S ⑯ attached to it.

Note: Take care not to open the LOAD GEAR hooks too much, because they may get deformed or broken. If they are, replace them.

2. Remounting

1) Apply grease to the hole ⑰ of the LOAD LEVER ASS'Y S ⑯, as shown in Fig. B.
2) Apply grease to the hole ㉒ of the LOAD LEVER ASS'Y T ⑫ as shown in Fig. A, and to the sections of the LOAD GEAR T ⑨ as indicated with an arrow in Fig. C.
3) Apply grease to GROOVE 1, GROOVE 2 and to the outer side of the MAIN CAM ⑧, shown in Fig. E.
4) Apply grease to the three oval holes of the LOAD RACK ④ as shown in Fig. D.
5) Apply grease to the outer surface of axles ⑲, ⑳ and ㉘.
6) After assembling as shown in Fig. B, mount the LOAD GEAR S ⑬ onto the axle ⑲. Insert the ROLLER BASE S pin ⑱ into the hole ⑰ of the LOAD LEVER ASS'Y S.
7) After assembling as shown in Fig. A, mount the LOAD GEAR T ⑨ onto the axle ⑳. When doing so, align the INITIAL mode positioning alignment holes ㉑ of the LOAD GEAR S ⑬ and the LOAD GEAR T ⑨ to the INITIAL mode position. Insert the ROLLER BASE T pin ㉓ into the hole ㉒ of the LOAD LEVER ASS'Y T ⑫.
8) Mount the MAIN CAM ⑧ onto the axle ㉖. At the same time, be sure that the INITIAL mode positioning alignment holes ㉕ of the MAIN CAM ⑧ and the MODE CAM ㉔ match the INITIAL mode positioning alignment holes ㉞ of the MECHANISM CHASSIS. Also check to be sure that the pin ㉗ of the CAM PINCH LEVER ASS'Y is in GROOVE 1 of the MAIN CAM as shown in Fig. E.
9) Mount the LOAD RACK ④ onto the axles ㉘ and ㉛. At the same time, set the INITIAL mode positioning alignment marks ㉚ of the LOAD RACK ④ and the LOAD GEAR T ⑨ to the INITIAL mode position. Insert the LOAD RACK pin ㉙ into the MAIN CAM GROOVE 2 as shown in Fig. E.
10) Mount the spacer ⑥ and the special washer ⑦ onto the axle ㉖.
11) Mount the two special washers ③ onto the two axles ㉛.
12) Mount the REINFORCE BRACKET ② with the three screws ①.
13) Insert the connector into the DRUM MOTOR board (SV-5).
14) Confirm that loading and unloading are performed smoothly.

Note: Be sure to perform precise INITIAL mode positioning of cams and gears.

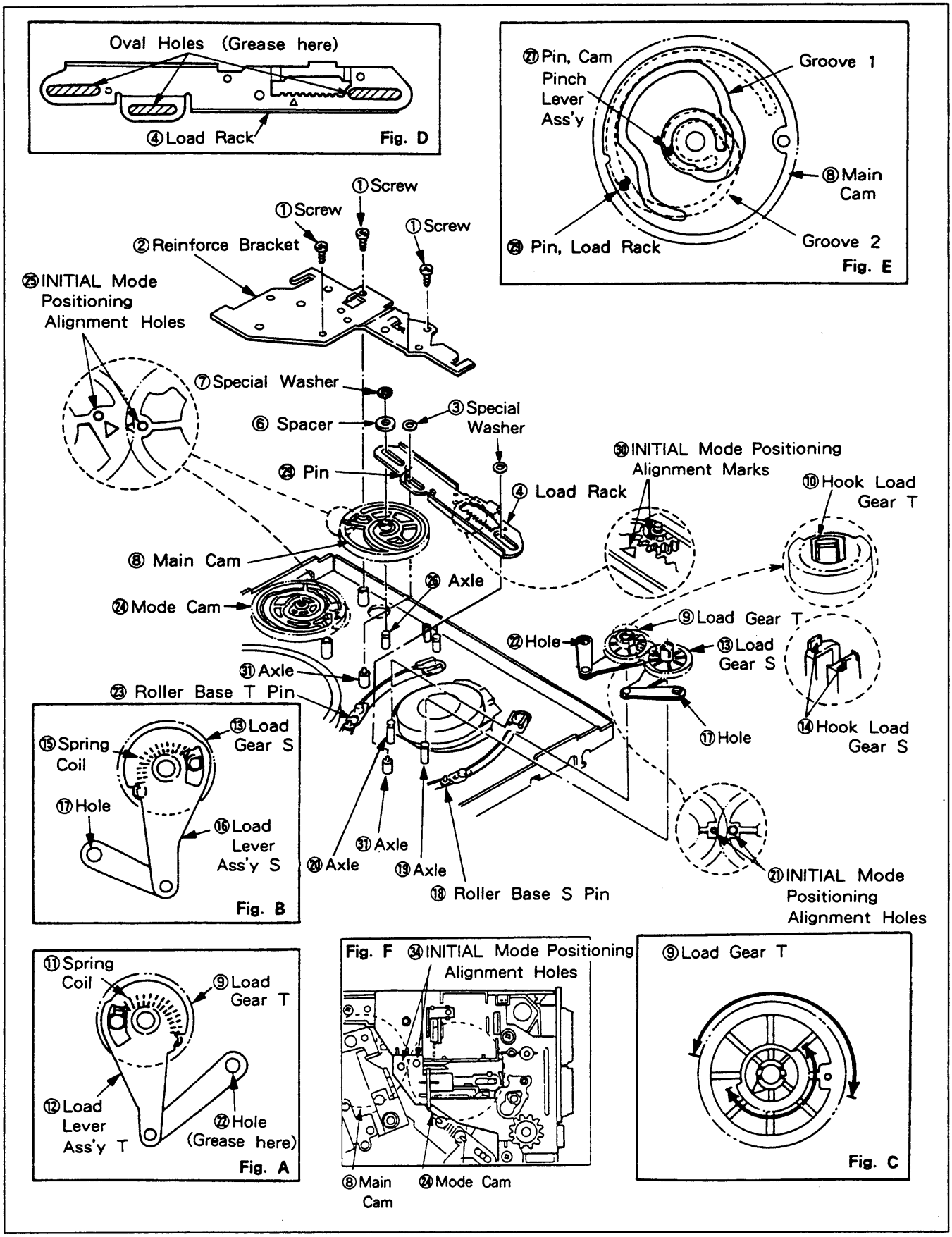


Fig. 2-4-1. Loading Mechanism Main Parts

2-4-2. MODE CAM (See Fig. 2-4-2.)

1. Removal

1) Set the INITIAL mode with the mode selector (VHJ-0050).
2) Remove the REINFORCE BRACKET as instructed in 2-4-1.
3) Remove the two special washers ①, then remove the CAM PLATE SLIDE ASS'Y ②.
4) Remove the MODE CAM ③.

2. Remounting

1) Referring to 2-4-1, confirm that the MAIN CAM is in the INITIAL mode position.
2) In case the MAIN CAM is misplaced, use the mode selector (VHJ-0050) to align the MAIN CAM positioning hole with the chassis INITIAL mode position hole (refer to 2-4-1 for the INITIAL mode position). Since the ROTARY SWITCH (mode detector switch) does not rotate, the mode selector indicator lamp will not show the correct mode.
3) Align the ROTARY SWITCH (mode detector switch) ④ with the INITIAL mode positioning alignment mark ⑤ as shown in Fig. A.
4) Mount the MODE CAM ③ onto the axle ⑥. Do it so that the SLIDE CAM ASS'Y pin ⑪ is placed in GROOVE 3 as shown in Fig. B.
5) Mount the CAM PLATE SLIDE ASS'Y ② onto the axles ⑥ and ⑦. Do it so that pin ⑧ gets into GROOVE 4 of the MODE CAM as shown in Fig. B, and the point of the bent-up part ⑨ goes into the ACT PLATE SLIDE ASS'Y hole ⑩.
6) Mount the two special washers ① onto the axles ⑥ and ⑦.
7) Mount the REINFORCE BRACKET as instructed in 2-4-1.

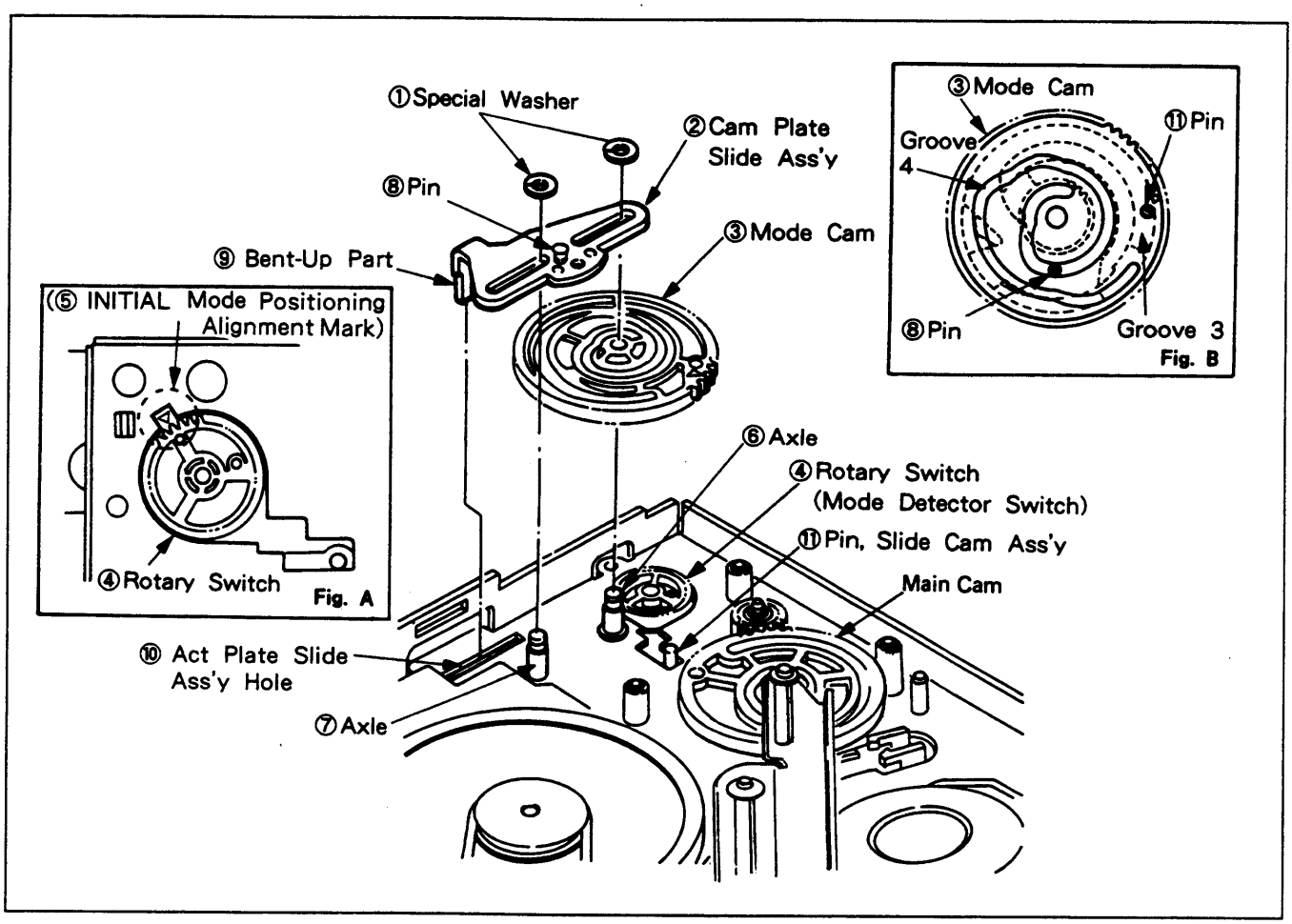


Fig. 2-4-2. Mode Cam

2-5. COMPL HEAD BRACKET (ACE HEAD) (See Fig. 2-5-1.)

1. Removal

1) Remove the special nut ②.
2) Remove the SLEEVE ③, the COMPL HEAD BRACKET ① and the SPRING COIL ④, in that order.

Note: Take care not to scratch or soil the ACE head surface.

2. Remounting

1) Apply grease to the axle ⑥ as shown in Fig. A.
2) Apply grease to the spot where the COMPL HEAD BRACKET ① makes contact with the STOPPER ⑦.
3) Mount the SPRING COIL ④ and the COMPL HEAD BRACKET ①, in that order, onto the axle ⑥. Hook one end of the SPRING COIL ④ to the notch ⑤, and the other end to the COMPL HEAD BRACKET, so that the COMPL HEAD BRACKET is pressed against the STOPPER ⑦.
4) Mount the special nut ② onto the axle ⑥ through the SLEEVE ③.
5) Clean the ACE head surface with a chamois leather moistened with methyl alcohol.
6) Perform ACE head adjustment as instructed in 4-4.

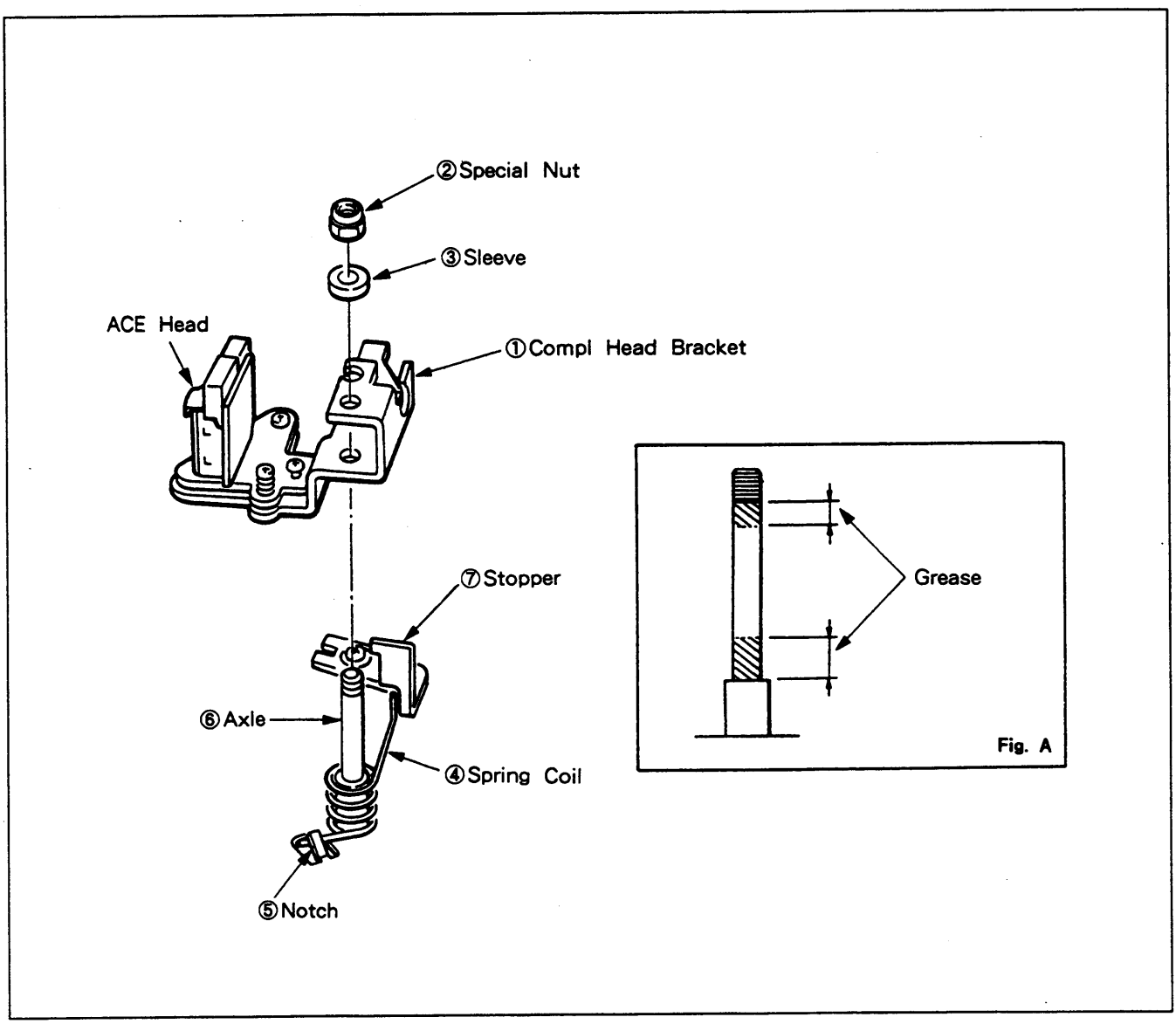


Fig. 2-5-1. Compl Head Bracket (ACE Head)

2-6. PINCH ROLLER PRESSURE MECHANISM (See Fig. 2-6-1.)

1. Removal

1) Remove the COMPL CASSETTE MECHANISM as instructed in 2-2-1.
2) Remove the COMPL HEAD BRACKET as instructed in 2-5.
3) Remove the PINCH SPRING COIL ①.
4) Remove the special washer ②, then remove the PINCH LEVER ASS'Y ③.
5) Remove the REV GUIDE LEVER SPRING COIL ④.
6) Remove the REV GUIDE LEVER ASS'Y ⑥ from the hook ⑤ of the plastic bearing on the bottom side. Use a jig VHJ-0073 shown in Fig. 2-6-2 to widen the hook of the plastic bearing. Doing so makes the removal of the REV GUIDE LEVER ASS'Y ⑥ a little easier. Care should be taken to avoid pushing the jig VHJ-0073 too much. Pushing it too hard could damage the hook.
7) Remove the SLIDE BRAKE SPRING COIL ⑦.
8) Remove the special washer ⑧, then remove the PINCH CAM LEVER ASS'Y ⑨.
9) Remove the ACT PINCH SLIDE ASS'Y ⑩.

Note: If the hook ⑤ of the plastic bearing is damaged, reference should be made to Section 3. "Method of Repairing the Bearing Section of REV GUIDE LEVER ASS'Y."

2. Remounting

1) Apply grease to pins ⑫/⑬ and axles ⑯/⑱.
2) Apply grease to the ACT PINCH SLIDE ASS'Y pin ⑰.
3) Set the INITIAL mode with the mode selector (VHJ-0050).
4) Mount the ACT PINCH SLIDE ASS'Y ⑩ onto pins ⑫ and ⑬.
5) Insert pin ⑭ of the PINCH CAM LEVER ASS'Y ⑨ into the MAIN CAM ⑪ GROOVE 1, and then mount the PINCH CAM LEVER ASS'Y onto the axle ⑯ while inserting the ACT PINCH SLIDE ASS'Y's pin ⑰ into the hole ⑮.
6) Mount the special washer ⑧ onto the axle ⑯.
7) Hook the SLIDE BRAKE SPRING COIL ⑦ to the plastic pin ⑲.
8) Mount the REV GUIDE LEVER ASS'Y ⑥ to the plastic molding bearing, then secure it with the hook ⑤ at the bottom.
9) Hook the REV GUIDE LEVER SPRING COIL ④.
10) Mount the PINCH LEVER ASS'Y ③ onto the axle ⑱.
11) Mount the special washer ② onto the axle ⑱.
12) Hook the PINCH SPRING COIL ① between the ACT PINCH SLIDE ASS'Y ⑩ and the PINCH LEVER ASS'Y ③.
13) Mount the COMPL HEAD BRACKET as instructed in 2-5.
14) Mount the COMPL CASSETTE MECHANISM as instructed in 2-2-1.
15) Perform ACE head adjustment as instructed in 4-4.

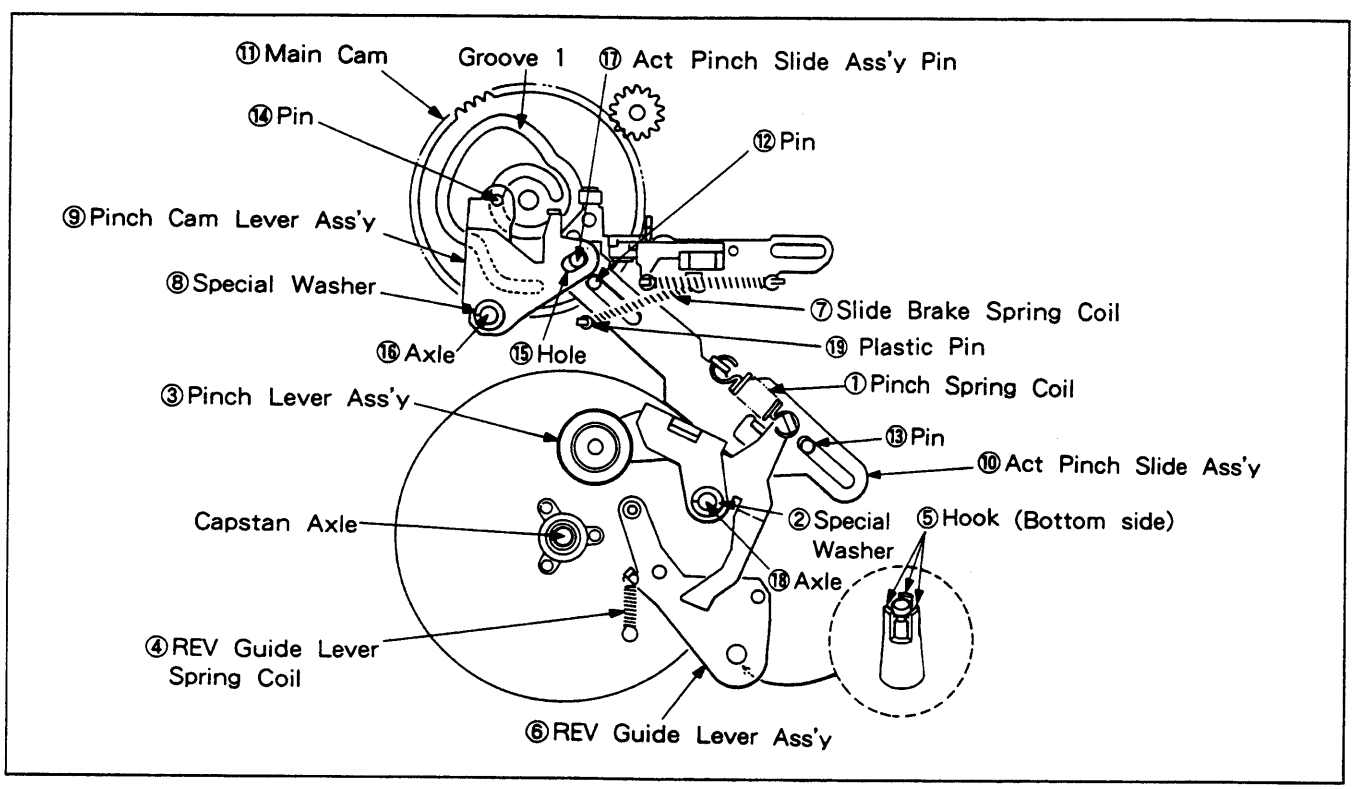
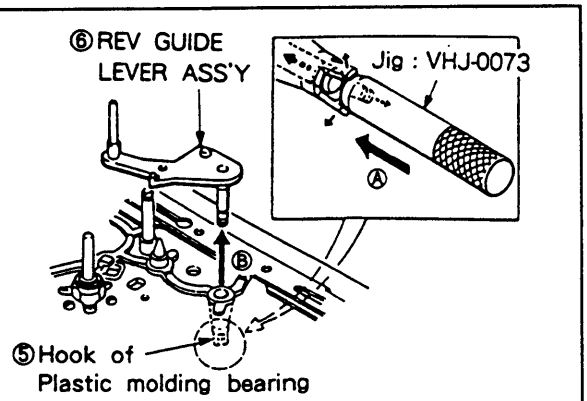


Fig. 2-6-1. Pinch Roller Pressure Mechanism



Remove REV GUIDE LEVER ASS'Y in the direction of arrow Ⓑ, pushing VHJ-0073 slightly in the direction of arrow Ⓐ.
Be careful not to damage the hook by pushing it too much.

Fig. 2-6-2. Method of Using the Jig VHJ-0073

3. Method of Repairing the Bearing Section of REV GUIDE LEVER ASS'Y

If the hook of the plastic molding bearing is damaged in the process of removing the REV GUIDE LEVER ASS'Y, proceed with the repair as follows :

1) Scrape the broken hook of the bearing section with a knife and flatten it.
2) Insert the REV GUIDE LEVER ASS'Y in the bearing and fit a stopper washer in. The special washer to be used must be Part No. 411 109 1605. This stop washer (part No. 411 109 1605) is the same as that used on the SUPPLY REEL ASS'Y or TAKE-UP REEL ASS'Y.

Remove the REV GUIDE LEVER ASS'Y in the direction shown by arrow B while pushing the jig VHJ-0073 lightly in the direction of arrowⒶ.
Pushing the jig VHJ-0073 too much may cause hook breakage. Therefore, care should be taken.

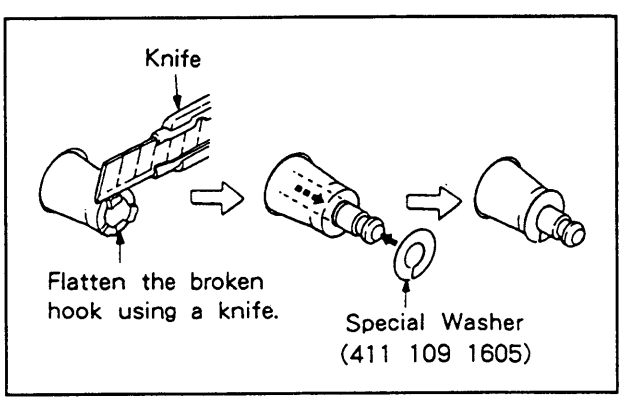


Fig. 2-6-3. Method of Repairing the Bearing Section of the REV GUIDE LEVER ASS'Y

2-7. BRAKE MECHANISM

2-7-1. SUB TAKE-UP BRAKE ASS'Y (See Fig. 2-7-1.)

1. Removal

1) Remove the COMPL CASSETTE MECHANISM as instructed in 2-2-1.
2) Remove the SPRING COIL ①.
3) While pushing the hook ② in the direction shown by the arrow in Fig. 2-7-1, remove the SUB TAKE-UP BRAKE ASS'Y ③.

2. Remounting

1) Mount the SUB TAKE-UP BRAKE ASS'Y ③ onto pin ④. Confirm that the hook ② is firmly hooked to the chassis.
2) Fit the SPRING COIL between hooks ⑤ and ⑥.
3) Mount the COMPL CASSETTE MECHANISM as instructed in 2-2-1.

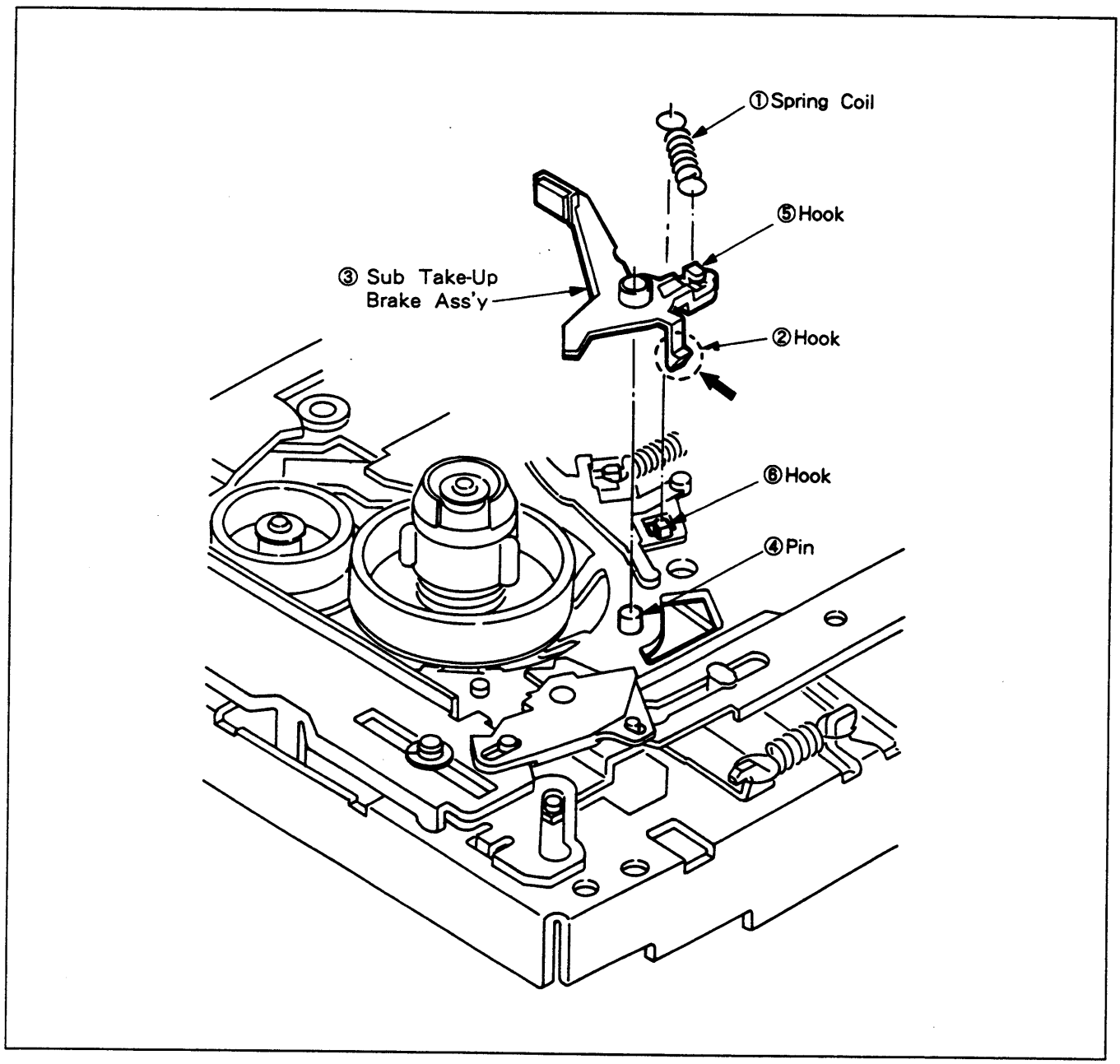


Fig. 2-7-1. Sub Take-Up Brake Ass'y

2-7-2. SUPPLY BRAKE ASS'Y AND TAKE-UP BRAKE ASS'Y (See Fig. 2-7-2.)

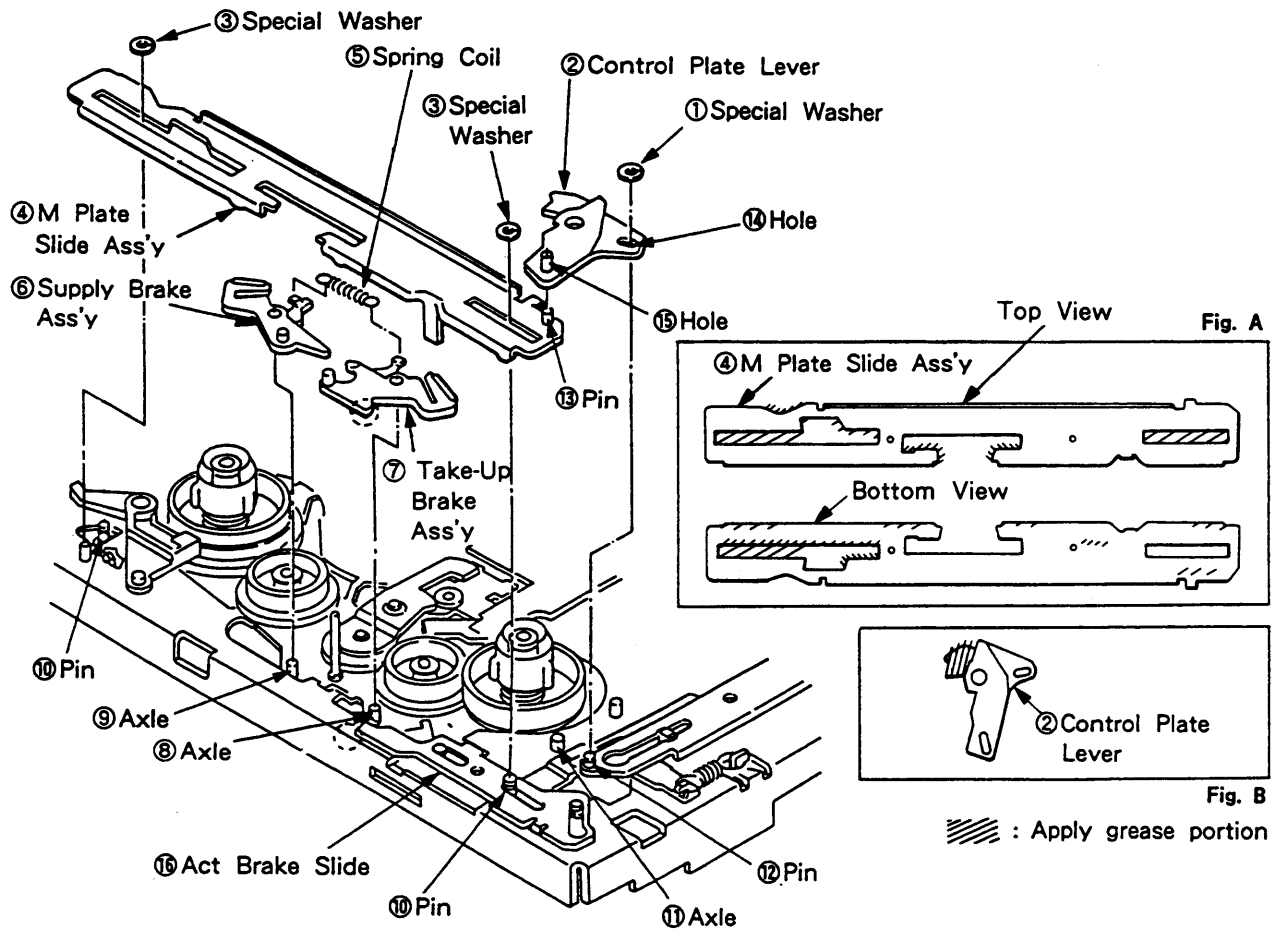
1. Removal

1) Remove the COMPL CASSETTE MECHANISM as instructed in 2-2-1.
2) Remove the SUB TAKE-UP BRAKE as instructed in 2-7-1.
3) Remove the special washer ①, then remove the CONTROL PLATE LEVER ②.
4) Remove the two special washers ③, then remove the M PLATE SLIDE ASS'Y ④.
5) Remove the SPRING COIL ⑤.
6) Remove the SUPPLY BRAKE ASS'Y ⑥ and the TAKE-UP BRAKE ASS'Y ⑦.

Note: Take care not to soil the brake shoes.

2. Remounting

1) Apply a thin layer of grease to axles ⑧ and ⑨.
2) Mount the TAKE-UP BRAKE ASS'Y ⑦ onto the axle ⑧.
3) Mount the SUPPLY BRAKE ASS'Y ⑥ onto the axle ⑨.
4) After applying a thin layer of grease to the M PLATE SLIDE ASS'Y ④ as shown in Fig. A, mount it onto the two pins ⑩.
5) Mount the two special washers ③ onto the two pins ⑩.
6) After applying grease to the CONTROL PLATE LEVER ② as shown in Fig. B, mount it onto the axle ⑪. Insert pin ⑫ of the ACT PLATE SLIDE ASS'Y into the hole ⑭, and pin ⑬ of the M PLATE SLIDE ASS'Y into the hole ⑮.
7) Mount the special washer ① onto pin ⑫.
8) Mount the SUB TAKE-UP BRAKE as instructed in 2-7-1.
9) Mount the COMPL CASSETTE MECHANISM as instructed in 2-2-1.



When assembling, the contact surfaces of the Take-Up Brake ⑦ and the Brake Slide ⑯ marked with ◌ should contact but not overlap each other.

Fig. 2-7-2. Supply Brake Ass'y & Take-Up Brake Ass'y

2-7-3. TENSION LEVER ASS'Y AND BAND HOLDER ASS'Y (See Fig. 2-7-3.)

1. Removal

1) Remove the COMPL CASSETTE MECHANISM as instructed in 2-2-1.
2) Remove the SPRING COIL ①.
3) Remove the screw ③ securing the BAND HOLDER ASS'Y ②.
4) Push the SUB SUPPLY BRAKE ④ in the direction shown by the arrow A, setting the BAND HOLDER ASS'Y ② free.
5) Open the hook ⑤ a little and remove the TENSION LEVER ASS'Y ⑥. Take care not to open the hook ⑤ too much because it may get deformed or broken.
6) Remove the hook ⑦ of the BAND HOLDER ASS'Y.

2. Remounting

1) Mount the BAND HOLDER ASS'Y hook ⑦ into the TENSION LEVER ASS'Y hole ⑧.
2) Insert the TENSION LEVER ASS'Y axle ⑨ into the hole ⑩ and confirm that the hook ⑤ is hooked.
3) While pushing the SUB SUPPLY BRAKE ④ in the direction shown by arrow A, attach the BAND HOLDER ASS'Y ② with the screw ③.
4) Hook the SPRING COIL ① between hooks ⑪ and ⑫.
5) Perform TENSION POLE position adjustment as instructed in 4-3.
6) Mount the COMPL CASSETTE MECHANISM as instructed in 2-2-1.

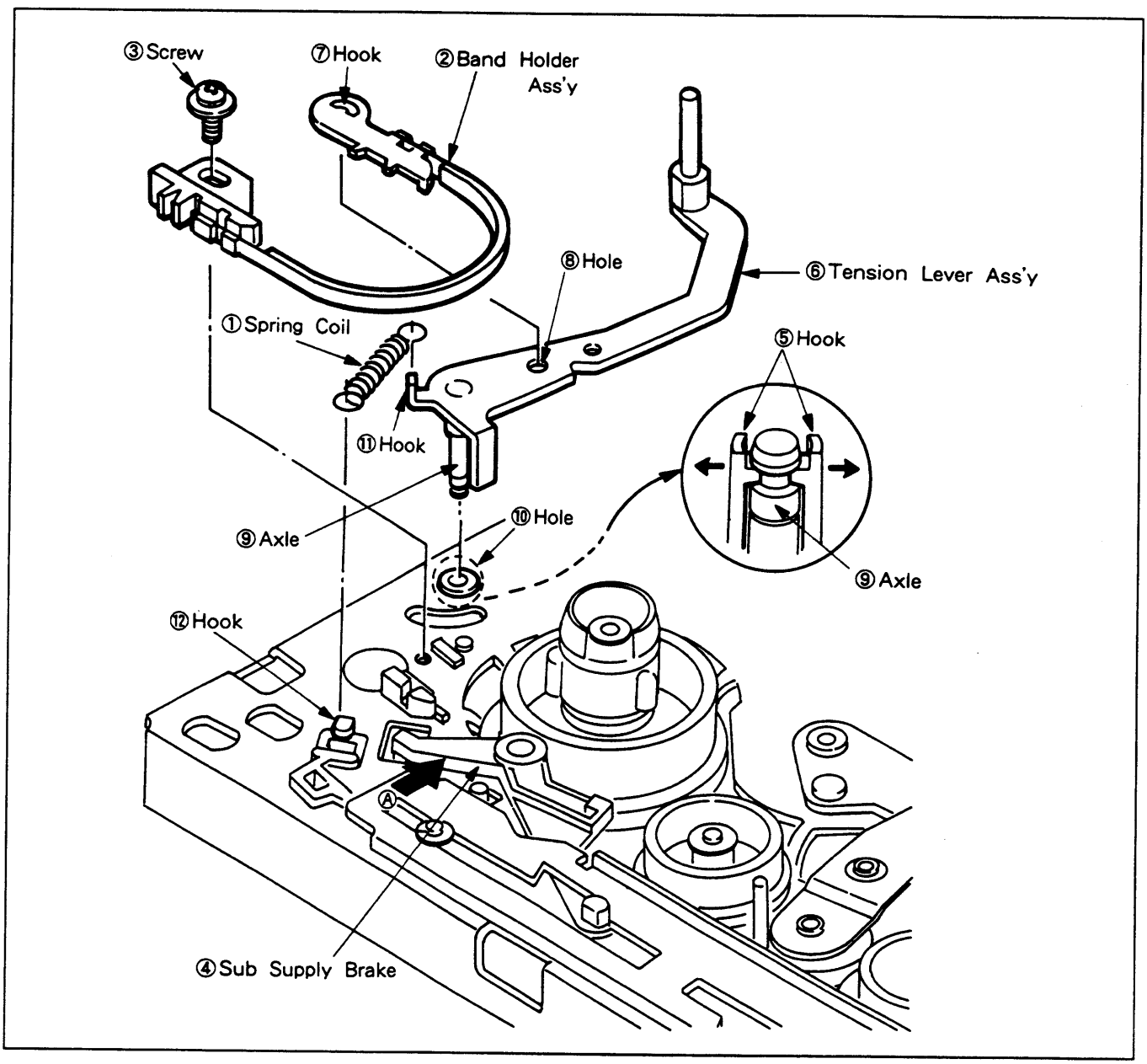


Fig. 2-7-3. Tension Lever Ass'y & Band Holder Ass'y

2-7-4. CAPSTAN BRAKE ASS'Y (See Fig. 2-7-4.)

1. Removal

1) Remove the SPRING COIL ①.
2) Unhook the hook ②, then remove the CAPSTAN BRAKE ASS'Y ③.

2. Remounting

1) Mount the CAPSTAN BRAKE ASS'Y ③ onto the axle ④. Confirm that the hook ② is hooked to the chassis.
2) Hook the SPRING COIL ① between hooks ⑤ and ⑥. Secure the hook ⑥ side with adhesive (use an adhesive that allows later detaching).

Note: As for the model with two video heads, there are two types : one with the spring coil ① and CAPSTAN BRAKE ASS'Y ③ installed, and one without these parts.

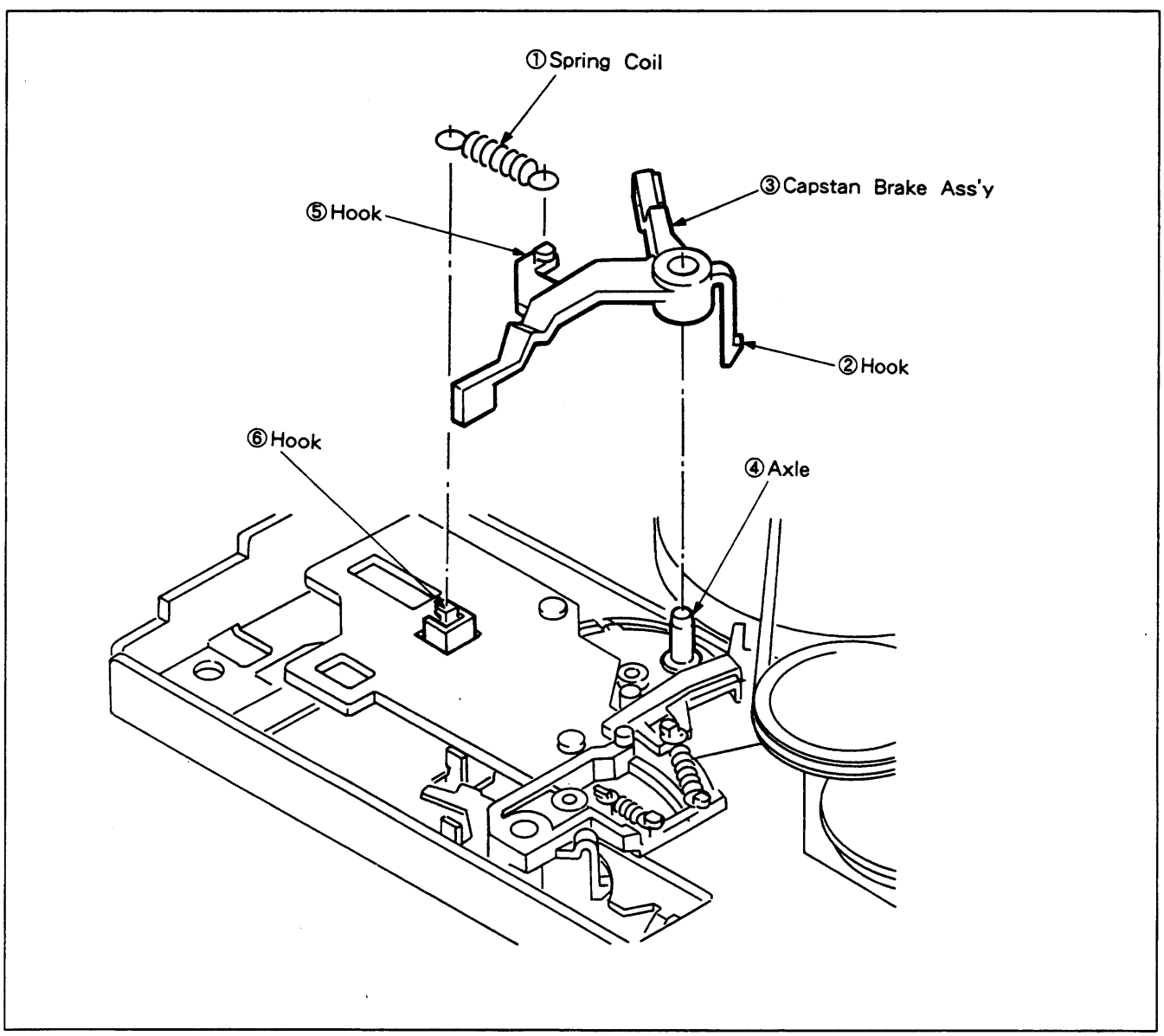


Fig. 2-7-4. Capstan Brake Ass'y

2-8. REEL TABLE DRIVE MECHANISM

2-8-1. SUPPLY REEL ASS'Y AND SUPPLY REEL GEAR (See Fig. 2-8-1.)

1. Removal

1) Remove the COMPL CASSETTE MECHANISM as instructed in 2-2-1.
2) Remove the BAND HOLDER ASS'Y as instructed in 2-7-3.
3) Set the PLAY mode with the mode selector (VHJ-0050).
4) Remove the special washer ①, then remove the SUPPLY REEL ASS'Y ② and the washer ③.
5) Remove the special washer ④.
6) While pushing the SUPPLY BRAKE ASS'Y ⑤ in the direction shown by arrow A, remove the SUPPLY REEL GEAR ⑥ and the washer ⑦.

Note: Be sure that no dirt gets on the section where both brake shoes make contact.

2. Remounting

1) Apply a little oil (less than one drop) to the part of the axle ⑧ indicated by arrow B, then slide the washer ⑦ over the axle.
2) While pushing the SUPPLY BRAKE ASS'Y ⑤ in the direction shown by arrow A, slide the SUPPLY REEL GEAR ⑥ onto the axle ⑧.
3) Slide the special washer ④ over the axle ⑧.
4) Apply 1 drop of oil to the part of the axle ⑨ indicated by arrow C, then slide the washer ③ over the axle.
5) Slide the SUPPLY REEL ASS'Y ② onto the axle ⑨.
6) Perform reel table height adjustment as instructed in 4-2-1.
7) Slide the special washer ① over the axle ⑨.
8) Mount the BAND HOLDER ASS'Y as instructed in 2-7-3.
9) Perform tension pole position adjustment as instructed in 4-3.
10) Mount the COMPL CASSETTE MECHANISM as instructed in 2-2-1.

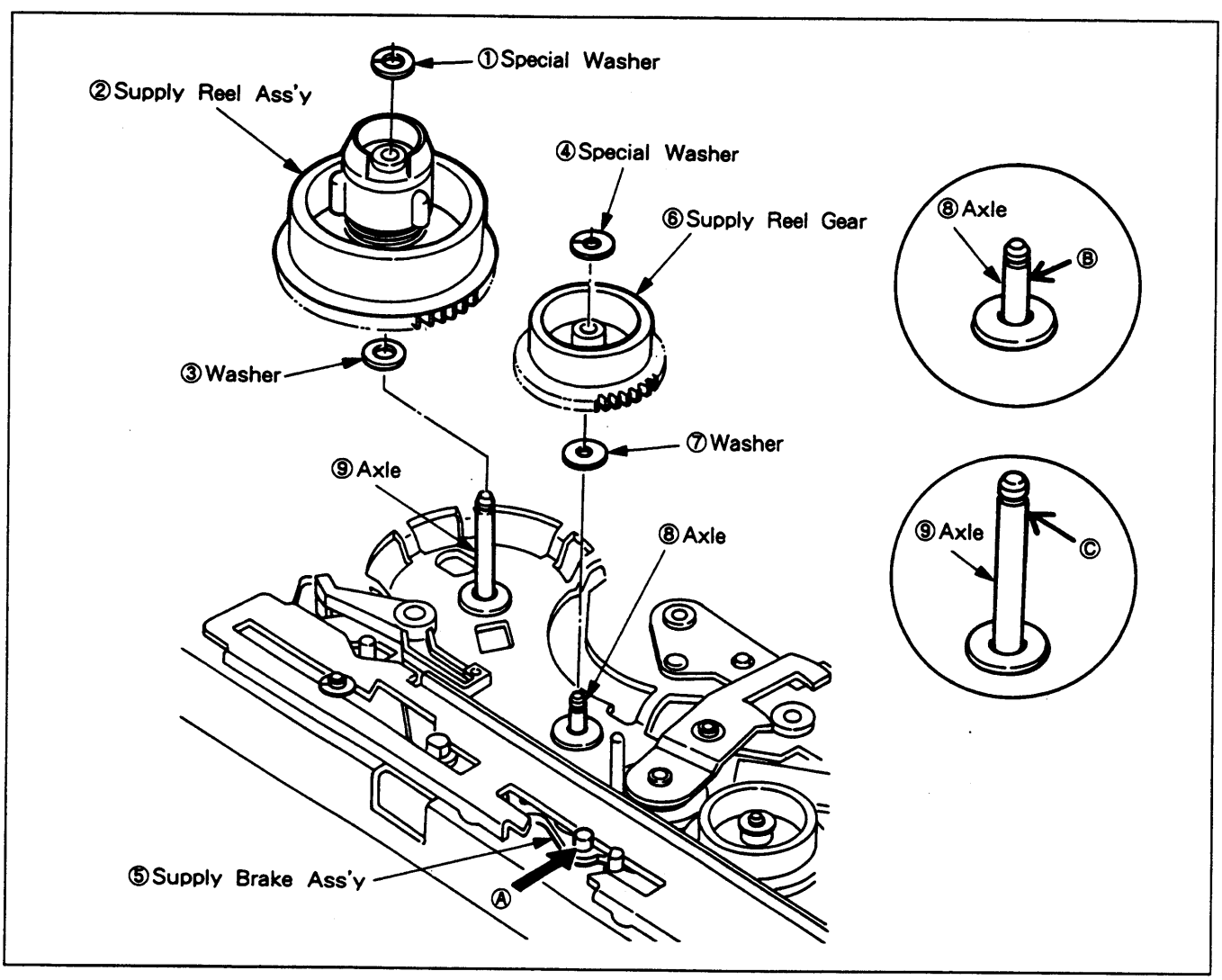


Fig. 2-8-1. Supply Reel Ass'y & Supply Reel Gear

2-8-2. TAKE-UP REEL ASS'Y (See Fig. 2-8-2.)

1. Removal

1) Remove the COMPL CASSETTE MECHANISM as instructed in 2-2-1.
2) Remove the special washer ①.
3) Push the SUB TAKE-UP BRAKE ASS'Y ② in the direction shown by arrow A to release the brake, then remove the TAKE-UP REEL ASS'Y ③ and the washer ④.

Note: Be sure that no dirt gets on the section where both brake shoes make contact.

2. Remounting

1) Apply 1 drop of oil to the part of the axle ⑤ indicated by arrow B, then slide the washer ④ over the axle ⑤.
2) While pushing the SUB TAKE-UP BRAKE ASS'Y ② in the direction shown by arrow A, slide the TAKE-UP REEL ASS'Y ③ onto the axle ⑤.
3) Perform reel table height adjustment as instructed in 4-2.
4) Slide the special washer ① over the axle ⑤.
5) Mount the COMPL CASSETTE MECHANISM as instructed in 2-2-1.

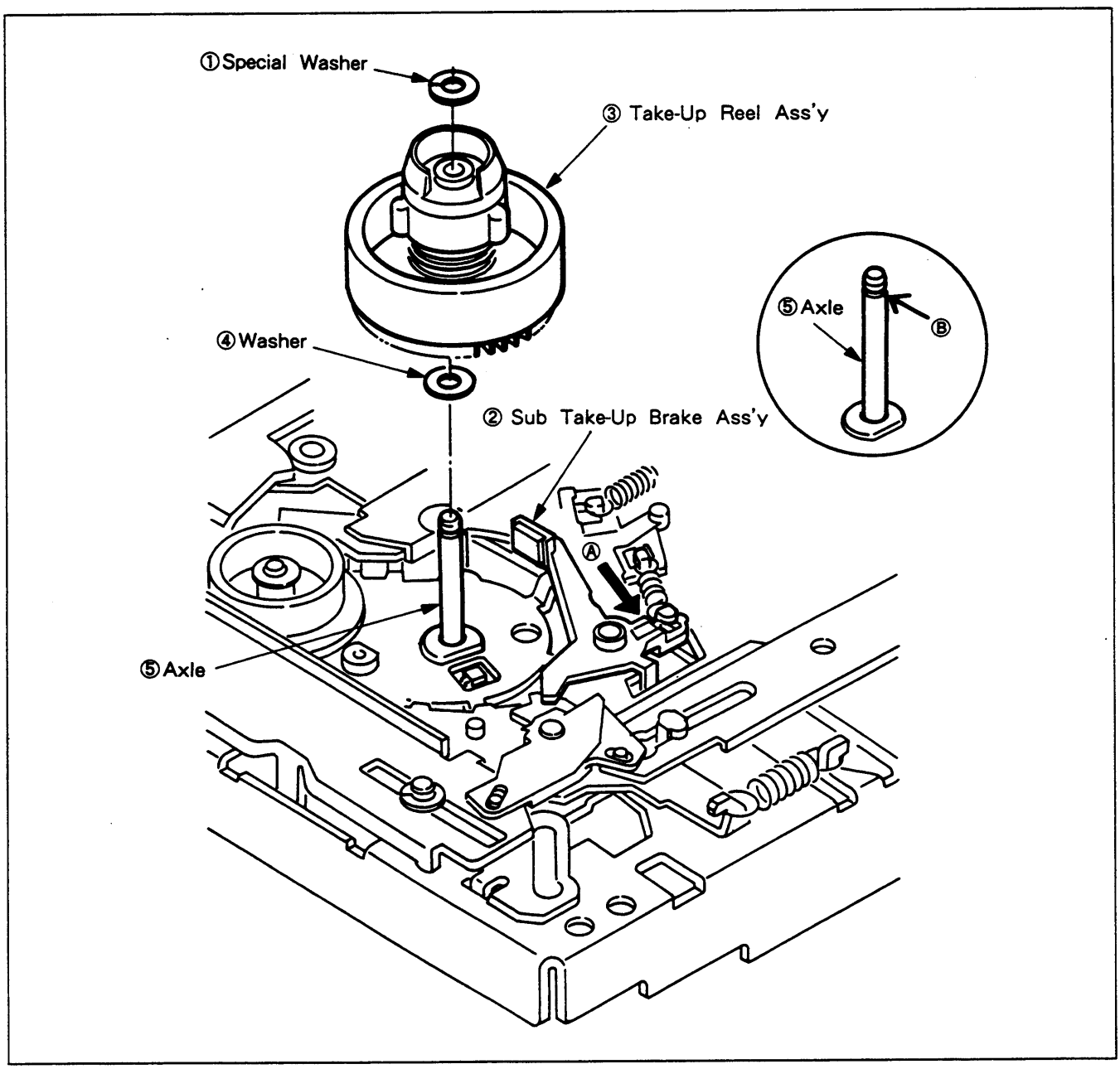


Fig. 2-8-2. Take-Up Reel Ass'y

2-8-3. TAKE-UP REEL GEAR (See Fig. 2-8-3.)

1. Removal

1) Remove the COMPL CASSETTE MECHANISM as instructed in 2-2-1.
2) Remove the TAKE-UP REEL ASS'Y as instructed in 2-8-2.
3) Remove the SUB TAKE-UP BRAKE ASS'Y as instructed in 2-7-1.
4) Remove the TAKE-UP BRAKE ASS'Y as instructed in 2-7-2.
5) Remove the special washer ①, then remove the TAKE-UP REEL GEAR ③ and the washer ④.

2. Remounting

1) Apply a little oil (less than one drop) to the part of the axle ⑤ indicated with an arrow.
2) Slide the washer ④ and the TAKE-UP REEL GEAR ③ onto the axle ⑤.
3) Slide the special washer ① over the axle ⑤.
4) Mount the TAKE-UP BRAKE ASS'Y as instructed in 2-7-2.
5) Mount the SUB TAKE-UP BRAKE ASS'Y as instructed in 2-7-1.
6) Mount the TAKE-UP REEL ASS'Y as instructed in 2-8-2.
7) Mount the COMPL CASSETTE MECHANISM as instructed in 2-2-1.

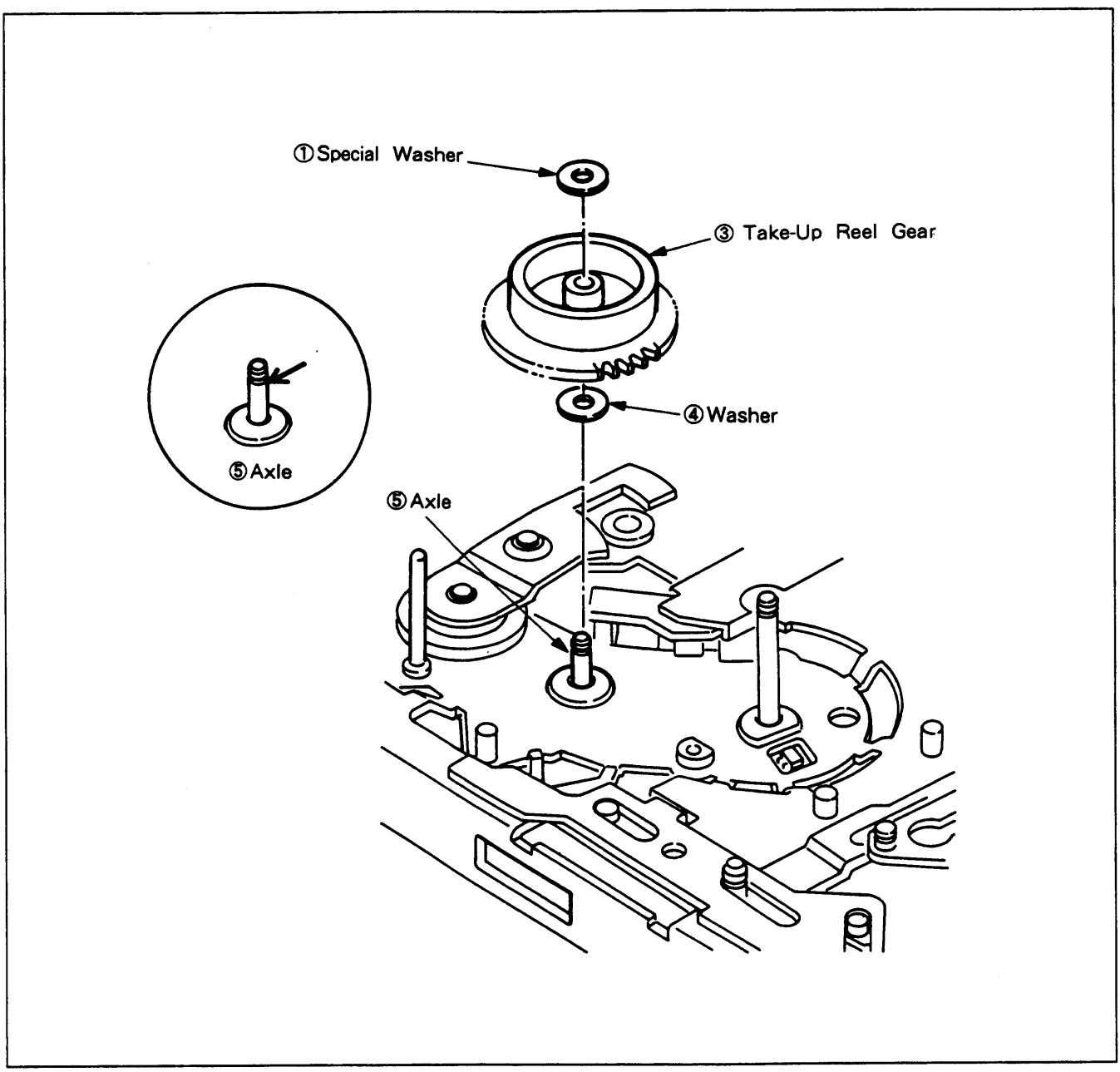


Fig. 2-8-3. Take-Up Reel Gear

2-8-4. REEL PULLEY AND FRICTION GEAR ASS'Y (See Fig. 2-8-4.)

1. Removal

1) Remove the REEL DRIVE BELT ③.
2) Remove the special washer ④, then remove the REEL PULLEY ⑤.
3) Remove the special washer ⑥, then remove the FRICTION GEAR ASS'Y ⑦ and the washer ⑧.

2. Remounting

1) Apply one drop of oil to the parts of axles ⑨ and ⑩ indicated with arrows.
2) Slide the washer ⑧ and the FRICTION GEAR ASS'Y ⑦ onto the axle ⑨.
3) Slide the special washer ⑥ over the axle ⑨.
4) Slide the REEL PULLEY ⑤ onto the axle ⑩.
5) Slide the special washer ④ over the axle ⑩.
6) Set the REEL DRIVE BELT ③.

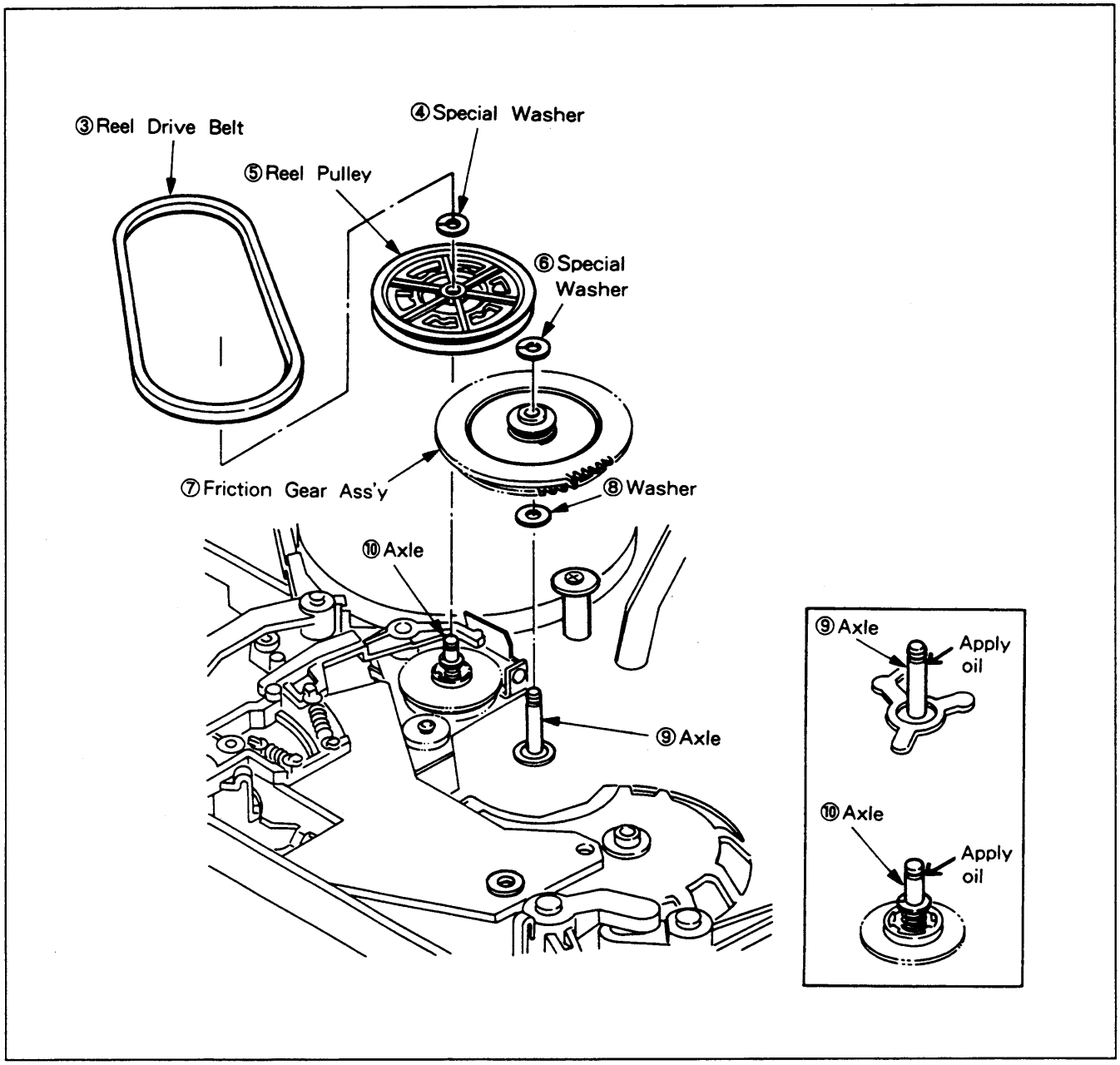


Fig. 2-8-4. Reel Pulley & Friction Gear

2-8-5. COMPL CLUTCH (See Fig. 2-8-5.)

1. Removal

1) Remove the COMPL CASSETTE MECHANISM as instructed in 2-2-1.
2) Remove the REEL DRIVE BELT and the REEL PULLEY as instructed in 2-8-4.
3) Remove the screw ①, then remove the COMPL MC-4 ②.
4) Remove the two screws ③, then remove the COMPL CLUTCH ④.

2. Remounting

1) Attach the COMPL CLUTCH ④ with the two screws ③, aligning it with the protuberance ⑤.
2) After inserting CN831 (COMPL MC-4) into CN801 (COMPL MC-1), attach the COMPL MC-4 with the screw ①.
3) Mount the REEL PULLEY and the REEL DRIVE BELT as instructed in 2-8-4.
4) Mount the COMPL CASSETTE MECHANISM as instructed in 2-2-1.

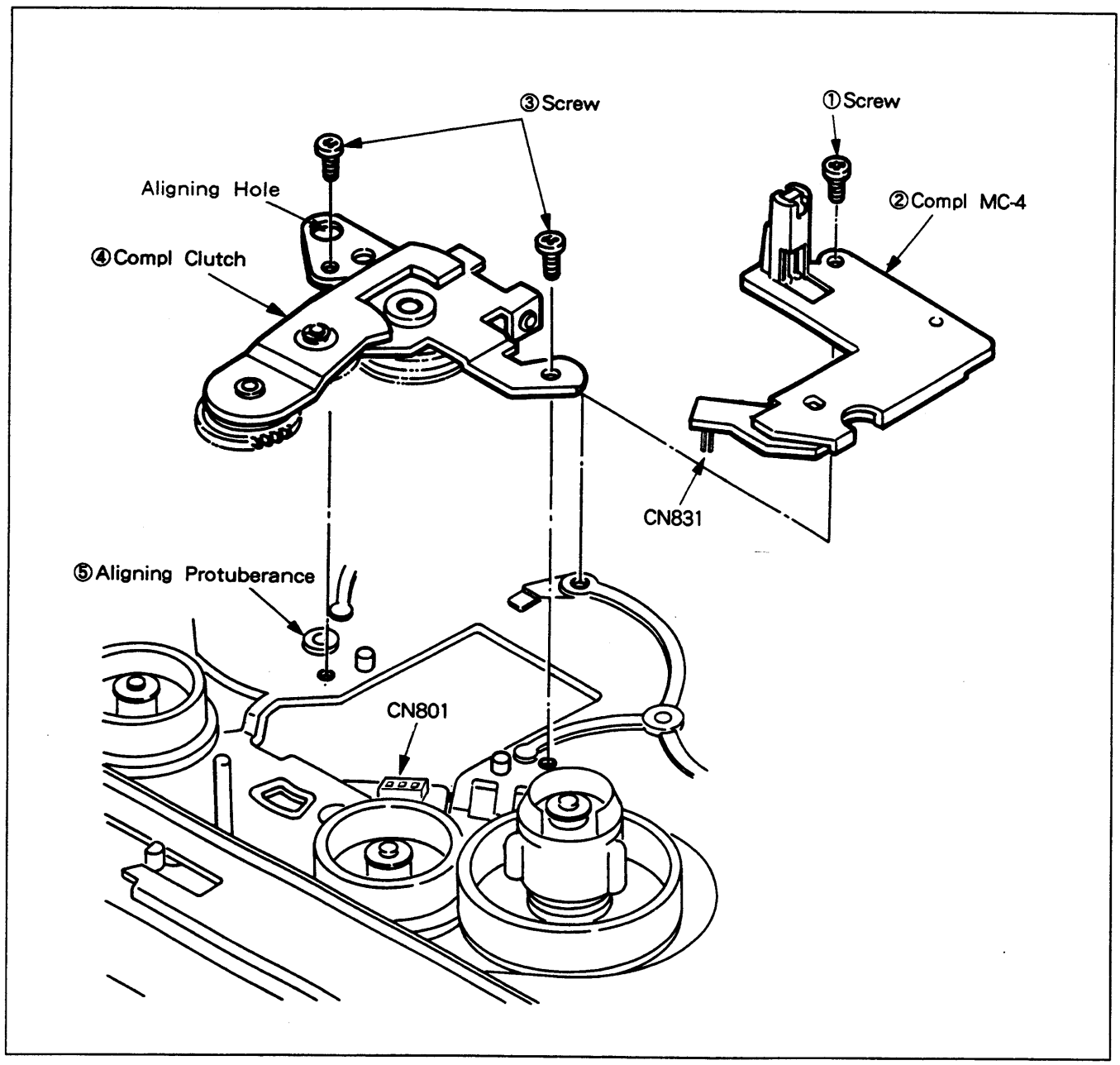


Fig. 2-8-5. Compl Clutch

2-8-6. CLUTCH CHANGE LEVER AND CLUTCH LEVER ASS'Y (See Fig. 2-8-6.)

1. Removal

1) Remove the CAPSTAN BRAKE ASS'Y as instructed in 2-7-4.
2) Remove the REEL DRIVE BELT and the REEL PULLEY as instructed in 2-8-4.
3) Remove the SPRING COIL ①.
4) Unhook the hook ②, then remove the CLUTCH CHANGE LEVER ③.
5) Unhook the hook ⑤, then remove the CLUTCH LEVER ASS'Y ⑥.

2. Remounting

1) Mount the CLUTCH LEVER ASS'Y ⑥ onto the axle ⑦. Confirm that the hook ⑤ is hooked to the chassis.
2) Mount the CLUTCH CHANGE LEVER ③ onto the axle ⑧. Confirm that the hook ② is hooked to the chassis.
3) Hook the SPRING COIL ① between hooks ⑨ and ⑩.
4) Mount the REEL DRIVE BELT and the REEL PULLEY as instructed in 2-8-4.
5) Mount the CAPSTAN BRAKE ASS'Y as instructed in 2-7-4.

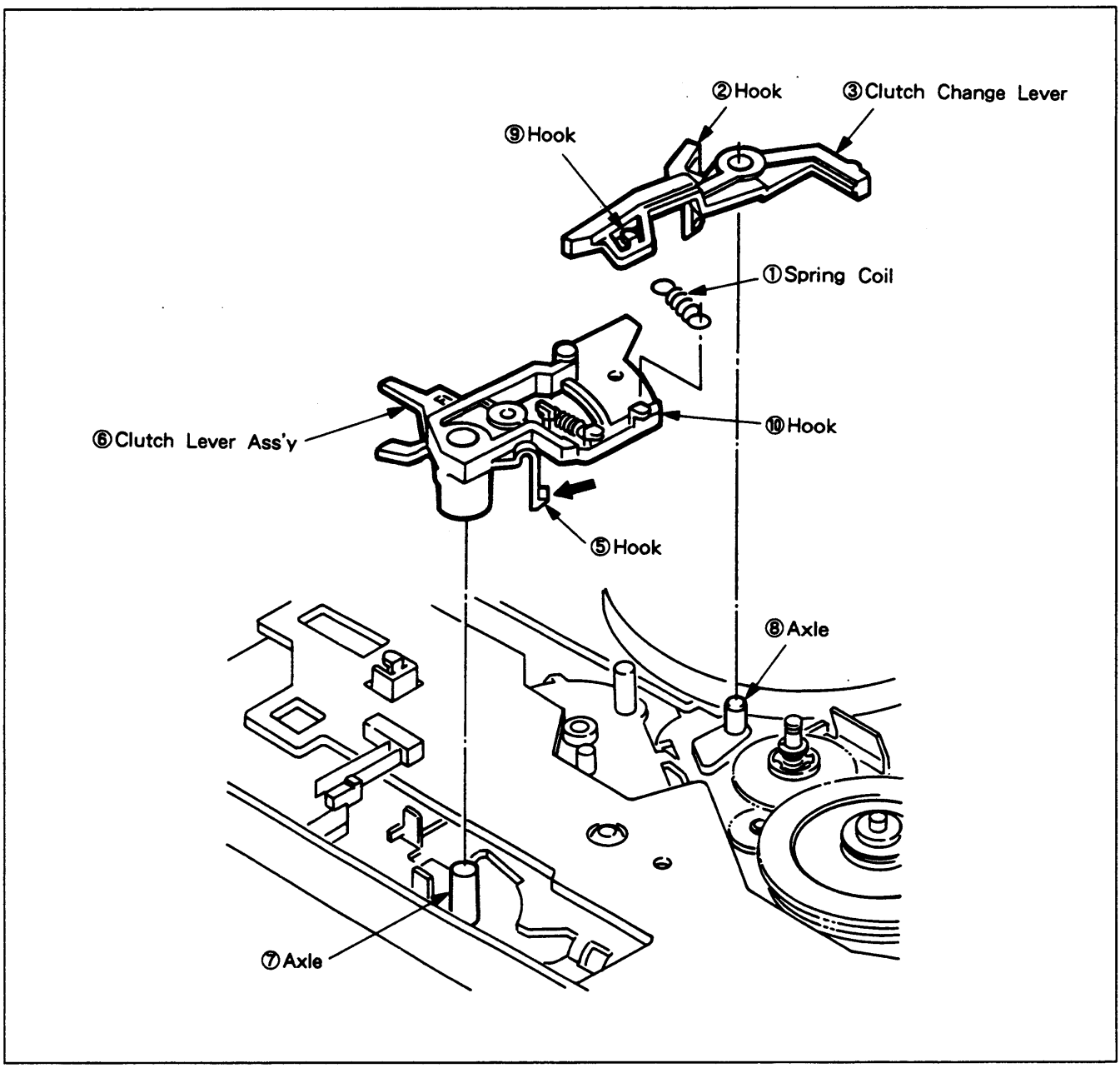


Fig. 2-8-6. Clutch Change Lever & Clutch Lever Ass'y

2-9. CAPSTAN MOTOR (See Fig. 2-9-1.)

1. Removal

1) Remove the CAPSTAN BRAKE ASS'Y as instructed in 2-7-4.
2) Remove the CAPSTAN MOTOR ⑥ connector.
3) Remove the REEL DRIVE BELT ② from the CAPSTAN MOTOR PULLEY ①.
4) Remove the two screws ④ securing the COMPL CASSETTE MECHANISM TOP BOARD ③, then slide the TOP BOARD ③ backward.
5) Remove the three screws ⑤, then remove the CAPSTAN MOTOR ⑥.

Note: Take care not to scratch or soil the capstan axle.

2. Remounting

1) Secure the CAPSTAN MOTOR ⑥ with the three screws ⑤.
2) Connect the CAPSTAN MOTOR ⑥ connector.
3) Attach the TOP BOARD ③ with the two screws ④.
4) Fit the REEL DRIVE BELT ② around the CAPSTAN MOTOR PULLEY ① and the REEL PULLEY ⑦.
5) Mount the CAPSTAN BRAKE ASS'Y as instructed in 2-7-4.

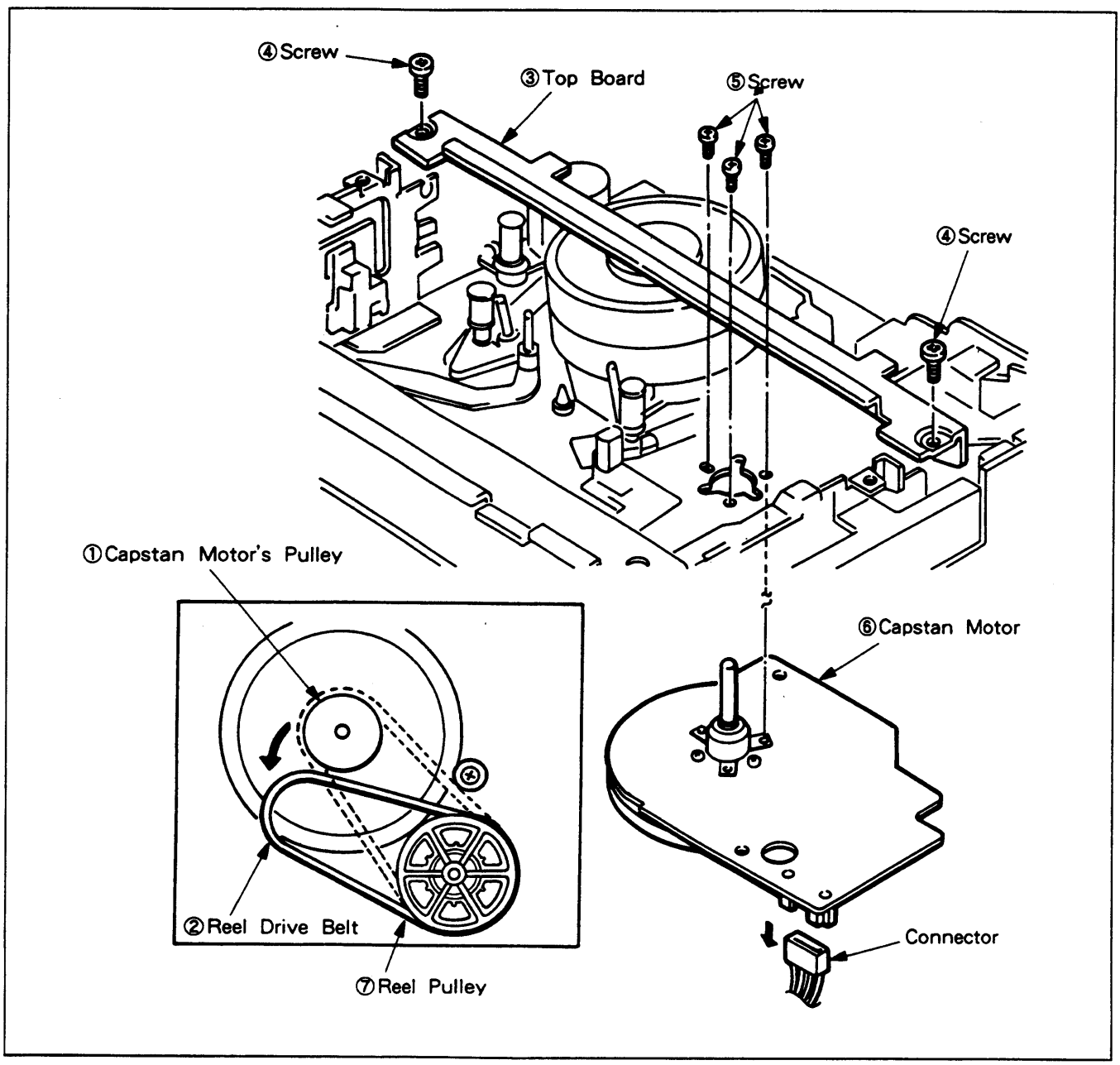


Fig. 2-9-1. Capstan Motor

2-10. FIXED GUIDE, FE HEAD LEVER ASS'Y

2-10-1. S-SIDE FIXED GUIDE AND FE LEVER ASS'Y (See Fig. 2-10-1.)

1. Removal

1) Remove the special nut ①, then remove the GUIDE PIPE ③ and the special washer ② (lower), in that order.
2) Remove the SPRING COIL ⑤.
3) Remove the FTE HEAD connector, then remove the FE HEAD LEVER ASS'Y ⑦.

2. Remounting

1) Mount the FE LEVER ASS'Y ⑦ onto the axle ⑧.
2) Hook the SPRING COIL ⑤ between the chassis notch ⑨ and the FE LEVER ASS'Y hook ⑩.
3) Mount the special washer ② (lower), the GUIDE pipe ③ and the special nut ① onto the axle ⑧, in that order. At that time, do not excessively tighten the special nut ① to avoid idle rotation of the axle rivet.
4) Connect the connector to the FTE HEAD.

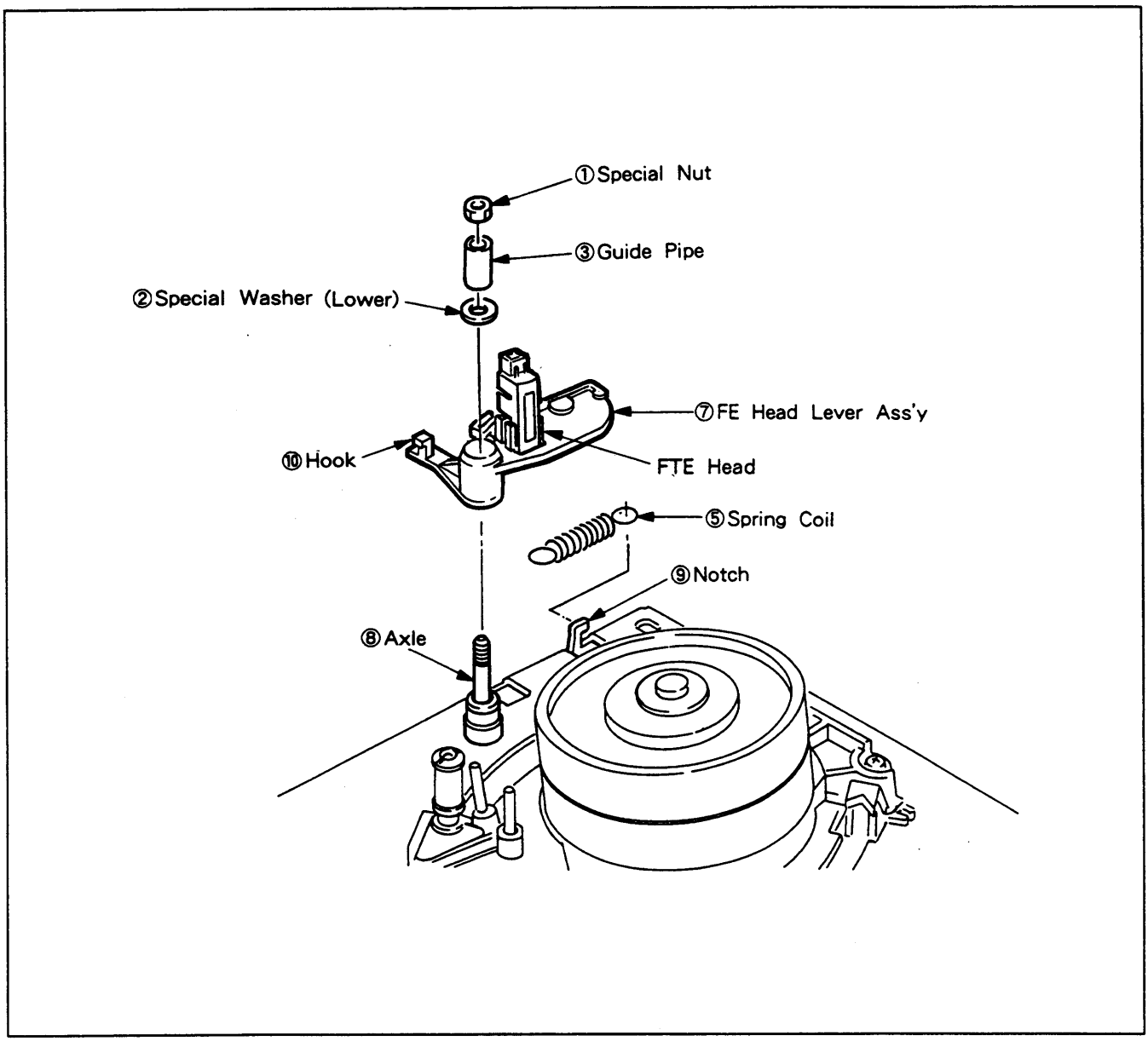


Fig. 2-10-1. Fixed Guide (S) & FE Lever Ass'y

2-10-2. FTE HEAD (See Fig. 2-10-2.)

1. Removal

1) Remove the FTE HEAD (full track erase head) ① connector.
2) Open the hooks ⑤ a little and remove the FTE HEAD ①.

Note: Take care not to open the hooks too much because it may get deformed or broken.

2. Remounting

1) Mount the FTE HEAD ① onto the FE HEAD LEVER ASS'Y ⑥. Confirm that the hooks ⑤ is hooked to the FTE HEAD ①.
2) Connect the connector of the FTE HEAD ①.

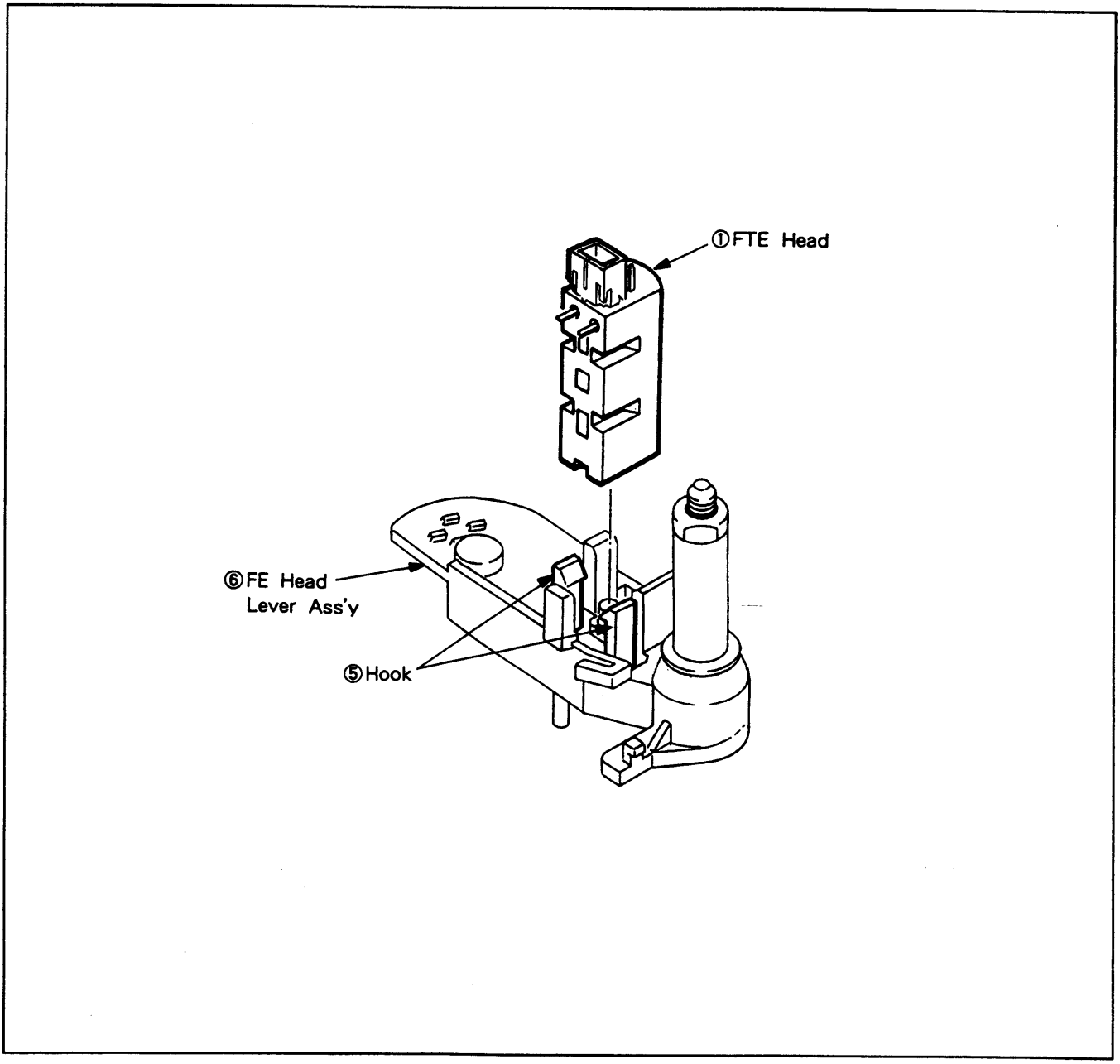


Fig. 2-10-2. FTE Head

2-10-3. FIXED GUIDE (T) (See Fig. 2-10-3.)

1. Removal

1) Remove the CAP ①.
2) Remove the special nut ②, then remove the special washer ③ (upper), the GUIDE PIPE ④, the special washer ③ (lower) and the SLEEVE ⑤, in that order.

2. Remounting

1) Mount the SLEEVE ⑤, the special washer ③ (lower), the GUIDE PIPE ④, the special washer ③ (upper) and the special nut ②, in that order, onto the axle ⑥.
2) Mount the CAP ① onto the axle ⑥.

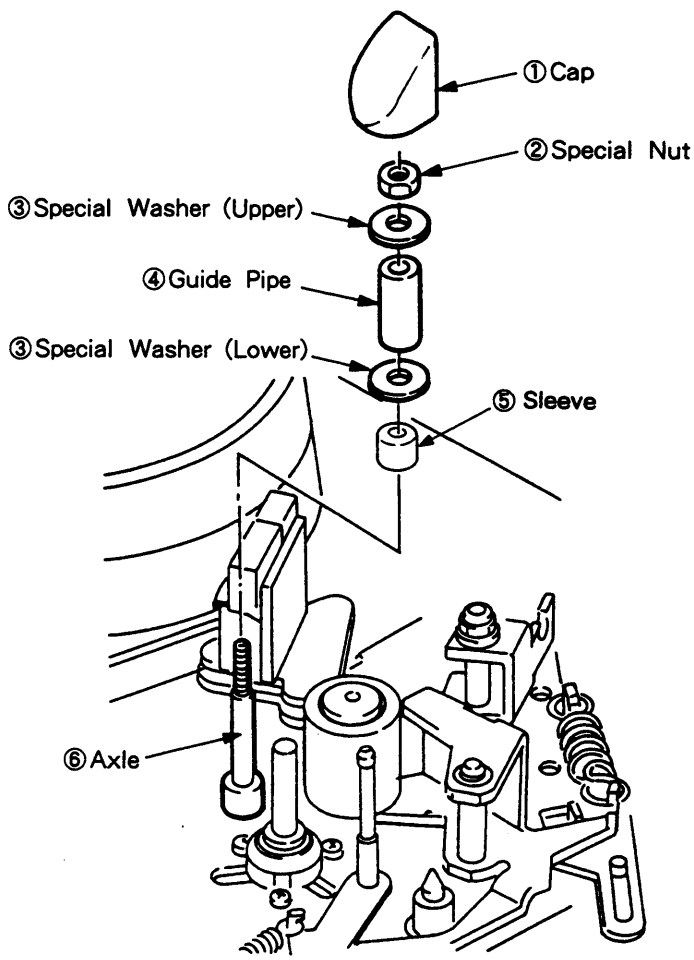


Fig. 2-10-3. Fixed Guide (T)

2-11. DRUM SECTION

2-11-1. DRUM MOTOR (ROTOR, STATOR) (See Fig. 2-11-1.)

1. Removal

1) Remove the LOAD RACK only, as instructed in 2-4-1.
2) Remove the screw ①, then remove the CYLINDER EARTH ASS'Y ②.
3) Remove the two screws ③, then remove the ROTOR ④ and the SPACER.
4) Remove the STATOR board connector.
5) Remove the three screws ⑤, then remove the STATOR ⑥.

2. Remounting

1) Secure the STATOR ⑥ with the three screws ⑤.
2) Mount the SPACER ⑪ onto the AXLE ⑫.
3) While aligning the ROTOR oval hole ⑦ with the ROTOR DISK hole ⑧, attach the ROTOR with the two screws ③.
4) Insert the connector ⑩.
5) Mount the LOAD RACK as instructed in 2-4-1.
6) While aligning the CYLINDER EARTH ASS'Y ② protuberance with the chassis hole ⑨, secure it with the screw ①.

Note 1: Use a torque driver (VHJ-0014) for mounting the STATOR ⑥ and the ROTOR ④. Set fastening torque to 3 kg-cm.

Note 2: When the drum unit has been replaced, perform a tape path adjustment as instructed in 4-4 and perform a PB PHASE adjustment of the servo circuit.

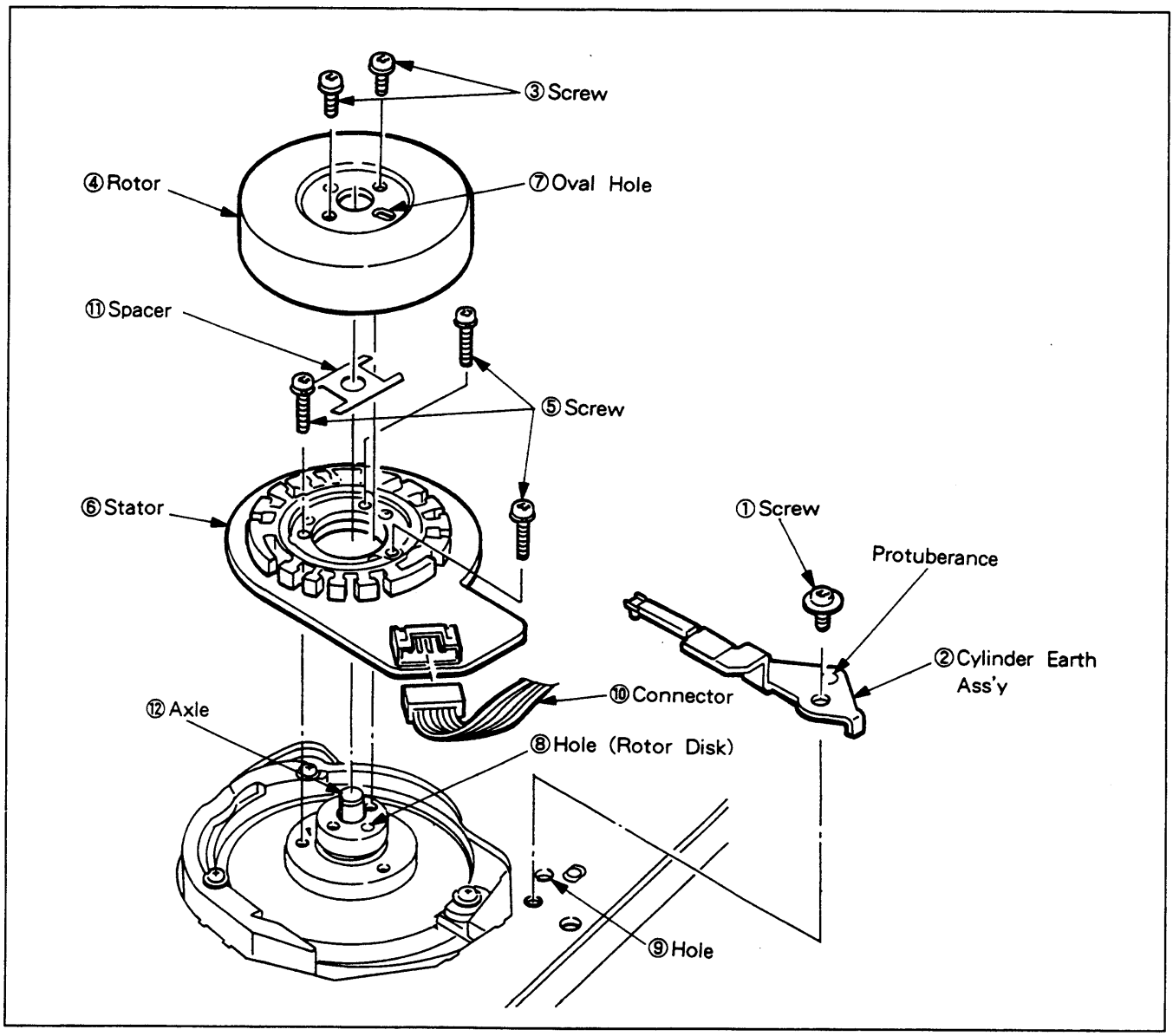


Fig. 2-11-1. Drum Motor

2-11-2. DRUM UNIT (See Fig. 2-11-2.)

1. Removal

1) For some models with the board located above the upper drum, remove the board.
2) Remove the flexible cable ① from the COMPL VP-1 (take care not to pull the flexible cable in an upward direction).
3) Remove the LOAD RACK only, as instructed in 2-4-1.
4) Remove the three screws ②, then remove the drum unit ③.

Note: When removing and remounting the drum unit, handle it carefully to protect it from scratches and dirt.

2. Remounting

1) While aligning the drum unit ③ to the protuberance, attach it to the drum base (CYLINDER BASE) ⑤ with the three screws ②.
2) Mount the ROAD RACK as instructed in 2-4-1.
3) Insert the flexible cable into the COMPL VP-1.
4) Clean the drum unit.
5) Perform the tape path adjustment as instructed in 4-4 and perform the PB PHASE adjustment of the servo circuit.

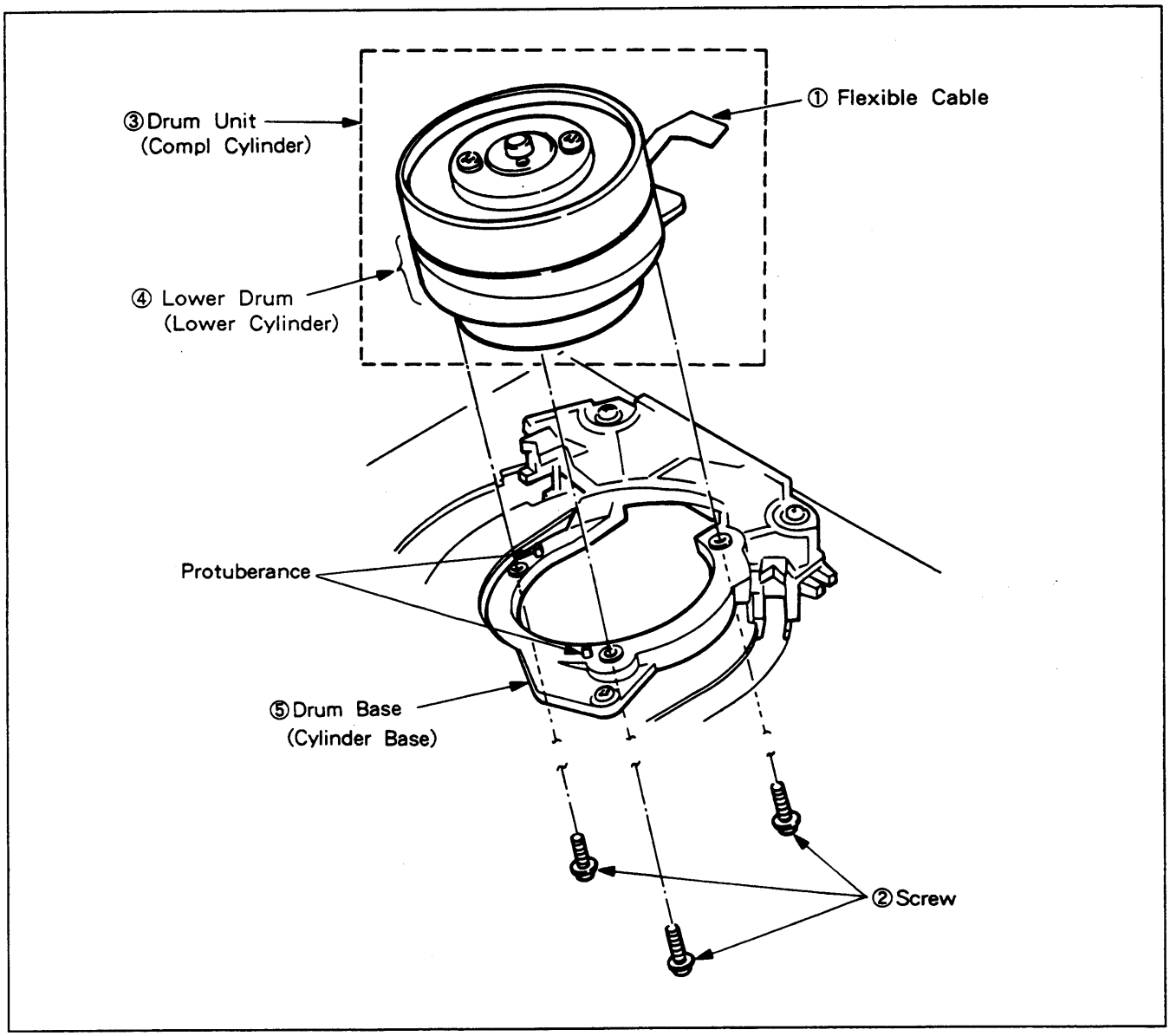


Fig. 2-11-2. Drum Unit (Compl Cylinder)

2-11-3. UPPER DRUM (Upper Cylinder)

1. Removal

1) Remove the two screws ①. (See Fig. 2-11-3.)
2) If the RE (ROTARY ERASE) HEAD is attached to the upper drum (UPPER CYLINDER), remove the lead wires soldered to the P.C. board. (See Fig. 2-11-4.)
3) Turn the head removing jig (VHJ-0041) handle ② counterclockwise to lift up the stopper ③. (See Fig. 2-11-5.)
4) Insert the two long screws ④ of the jig into the screw holes ⑥ located on the head chip side of the upper drum (UPPER CYLINDER) ⑤, then secure them by turning the handle clockwise.
5) While holding the jig so that the upper drum ⑤ does not rotate, turn the handle ② clockwise to remove the upper drum.
6) Remove the jig from the upper drum.

Note: Handle parts carefully to protect the drum from scratches and dirt, and the video head from damage.

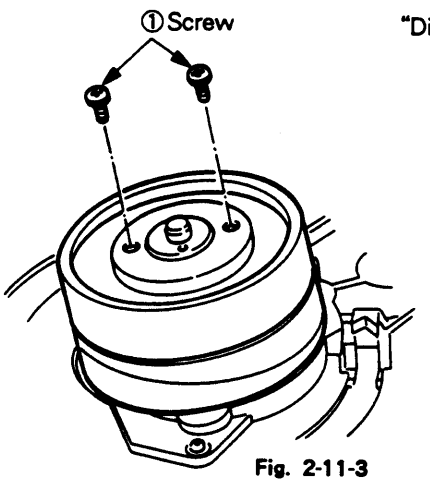


Fig. 2-11-3

Lead wires of Rotary Erase Head (Model for flying erase capability)

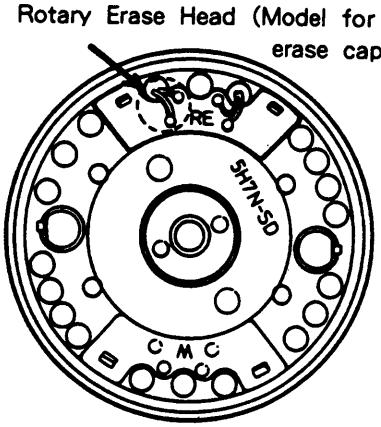


Fig. 2-11-4

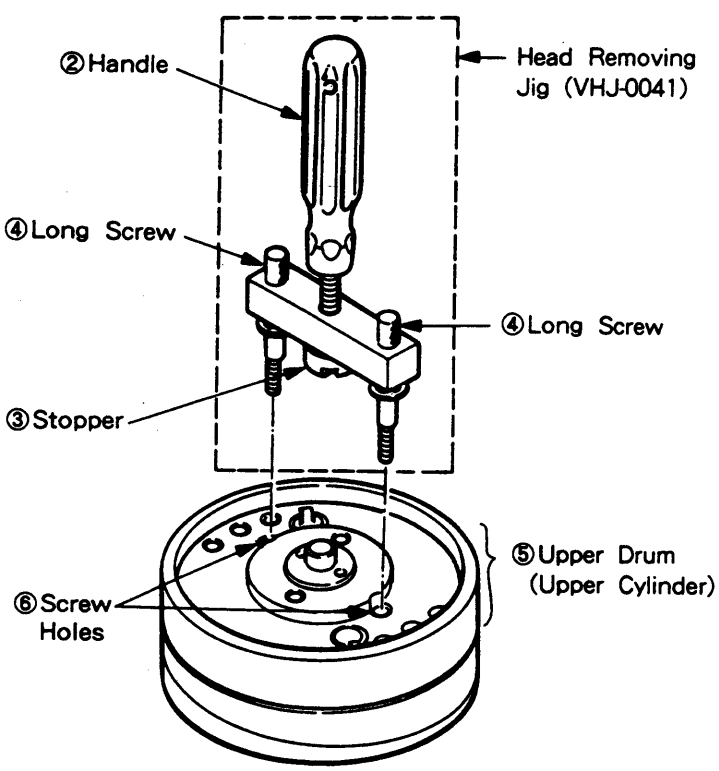


Fig. 2-11-5

Upper Drum (Upper Cylinder)

2. Remounting (See Fig. 2-11-6.)

1) Confirm that surfaces where the flywheel and the upper drum (UPPER CYLINDER) are engaged or make contact are free from scratches and dirt.
2) The code name ① of the drum is printed on the video head side of the upper drum ⑤ SP CH-1 (channel A, plus azimuth). The code name ① is set within the rotary transformer terminal on the round hole side ② of the lower drum (LOWER CYLINDER), so that the two screw holes ③ of the upper drum are aligned with the two screw holes ④ of the flywheel. (Refer to 3. Recognizing the SP CH-1 Head Side.)
3) If the RE (ROTARY ERASE) HEAD is attached to the upper drum, pass the lead wires through the lead wire hole. (See Fig. 2-11-4.)
4) While keeping the upper drum ⑤ parallel to the lower drum (LOWER CYLINDER) ⑧, insert it completely into the flywheel.
5) Temporarily tighten the two screws ⑦ alternately a little at a time, then tighten them to a torque of 6 kg-cm using a torque driver (VHJ-0014) and a 3 mm bit (VHJ-0045).
6) If the RE head is attached to the upper drum ⑤, solder the lead wires to the P.C. board. Solder the red lead wire to the R terminal, and the yellow lead wire to the Y terminal.

Note: When the upper drum has been replaced, perform a tape path adjustment as instructed in 4-4 and the PB PHASE adjustment of the servo circuit.

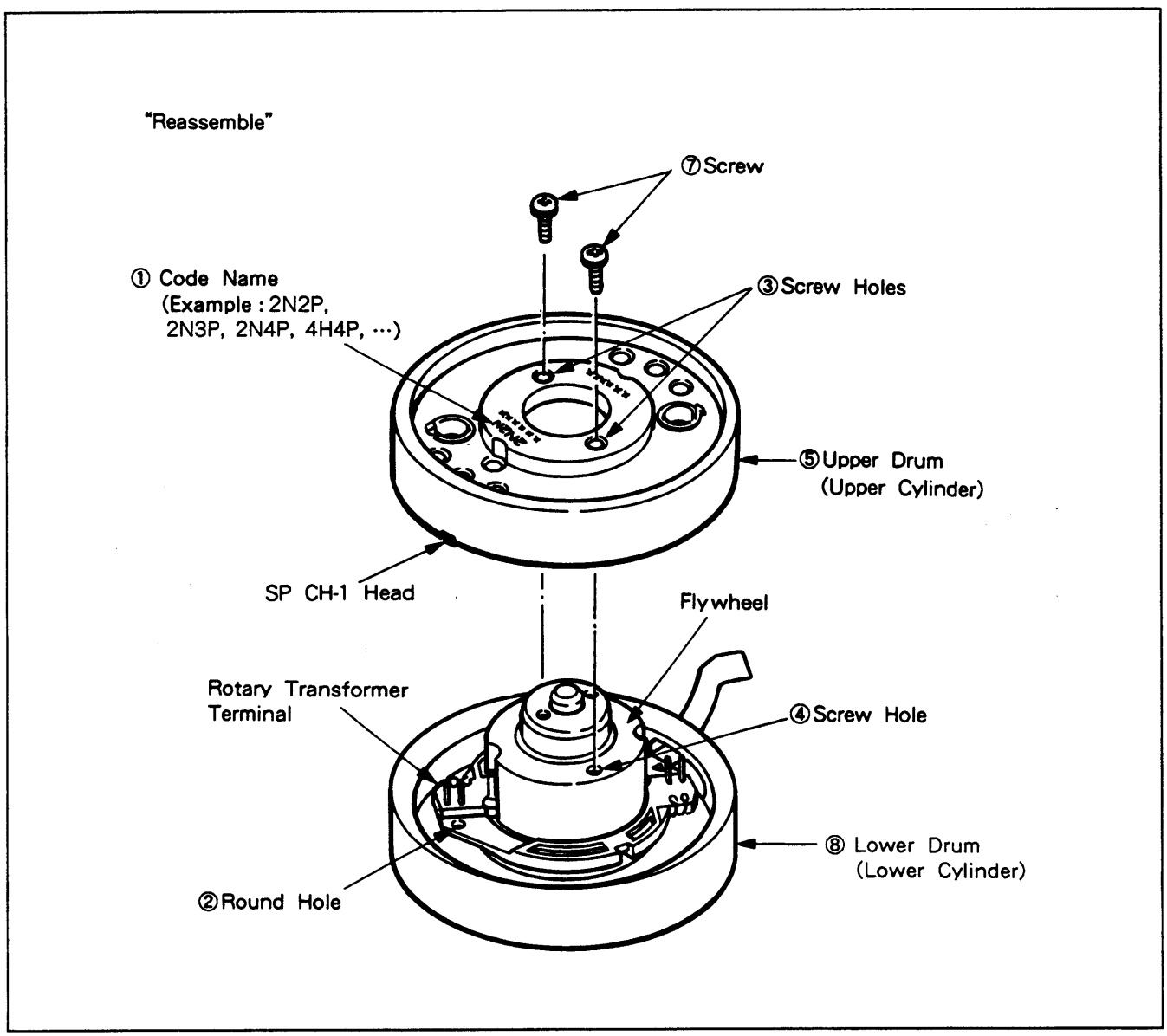


Fig. 2-11-6.

3. Recognizing the SP CH-1 Head Side

No playback picture can be obtained if the video head is not wired as a pair with the rotary transformer located inside the lower drum rotating section. Therefore, the mounting position should be matched when mounting the upper drum. The code name of the drum is printed on the SP CH-1 (CH-A, plus azimuth) side as a mark for mounting the upper drum. (See Fig. 2-11-7.) This code name differs according to the drum type, but its basic form is as follows :

A = Number of head bases
B = "N" for normal audio
"H" for HI-FI audio
C = Number of heads
D = TV system ("N" or "P")
EF = Code for detailed classification. Depending on drum type, it can also be just one character, or a blank space.

Code Name Form

4	H	4	P	D	S
A	B	C	D	E	F

Examples of Detailed Classification Codes
V = Head with level difference
D = Compatible with digital units
S = SVHS-compatible

Examples of Code Names
2N2P, 2N2P-L, 2N2P-V, 2N2P-D, 2N3P, 2N4P, 4H4P, 4H4P-D

Moreover, there is a round hole with marking purposes on the SP CH-1 (CH-A, plus azimuth) side of the lower drum rotary transformer terminal. As shown in Fig. 2-11-8, there are two types of rotary transformer terminals (the number of pins differs according to the number of heads).

Note: When ordering parts such as drums (CYLINDERS), do not use the code names ; always refer to the parts list and order with the specified part numbers.

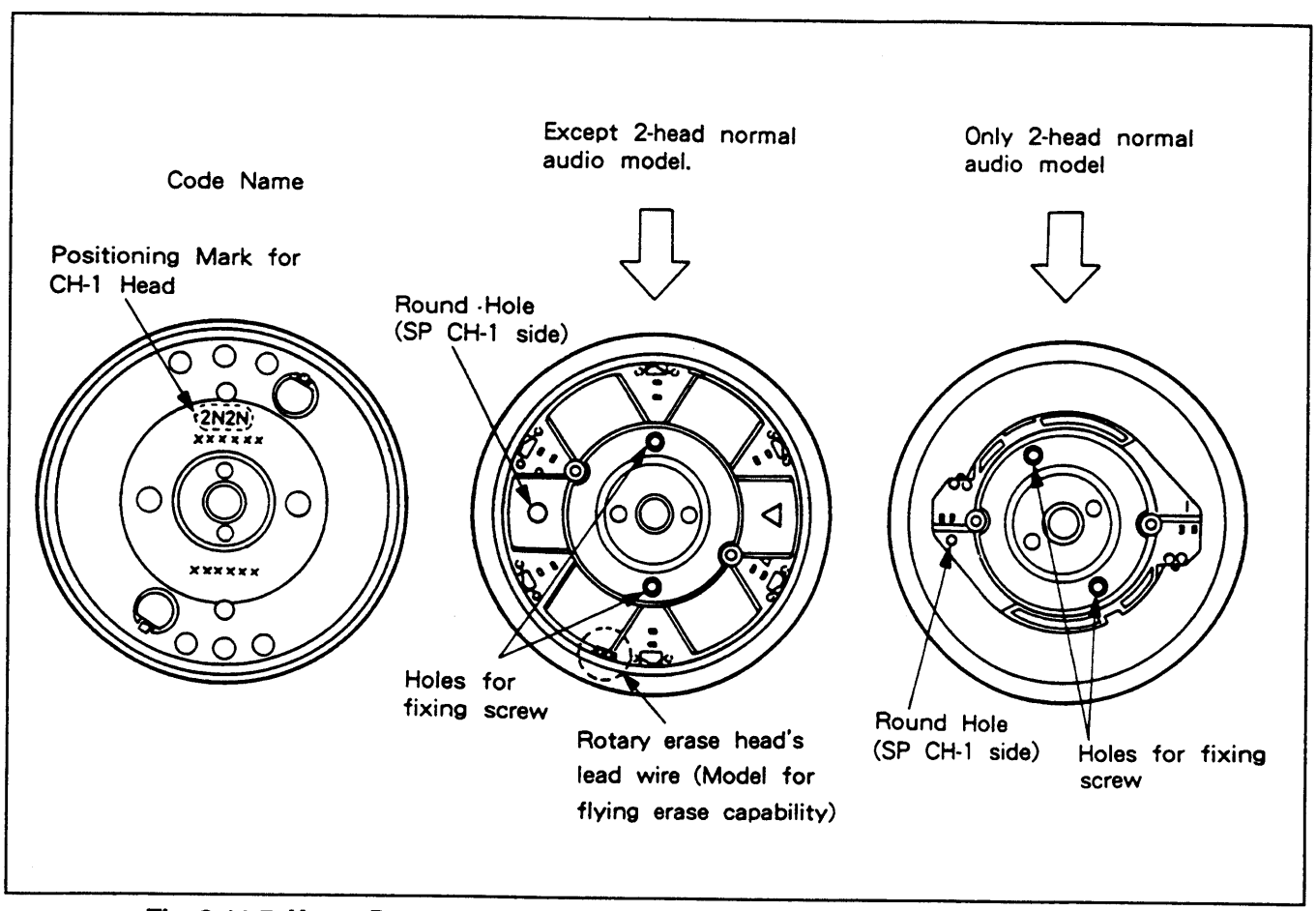

Code Name
Positioning Mark for CH-1 Head
2N2N
Except 2-head normal audio model.
Round Hole (SP CH-1 side)
Holes for fixing screw
Rotary erase head's lead wire (Model for flying erase capability)
Only 2-head normal audio model
Round Hole (SP CH-1 side)
Holes for fixing screw

Fig. 2-11-7. Upper Drum

Fig. 2-11-8. Lower Drum

2-12. AUTO HEAD CLEANING MECHANISM (See Fig. 2-12.)

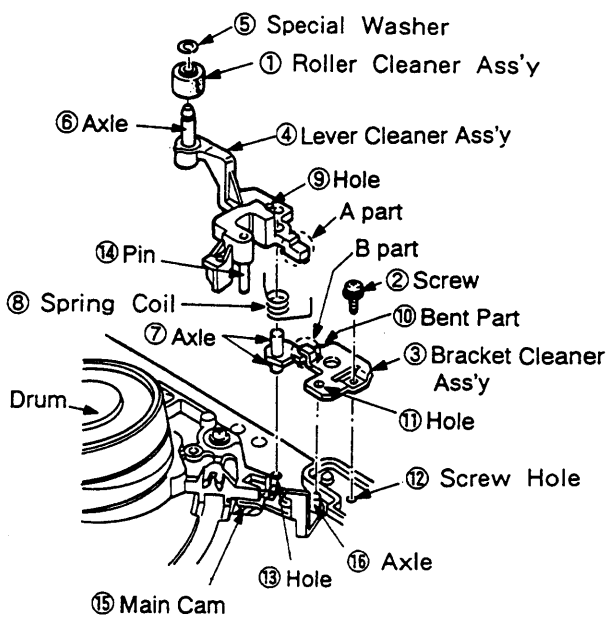
1. Removal

Note: • Do not hold the ROLLER CLEANER ASS'Y ① with your bare hands. Use tweezers and gloves not soiled with grease or dust, etc.
• When the cleaning function deteriorates and you are replacing only the ROLLER CLEANER ASS'Y ①, there is no need to perform item 4).

1) Be sure that the ROLLER CLEANER ASS'Y ① is not pressed against a drum (cylinder).
2) Remove the COMPL VP-1 and the PRE-AMP BRACKET.
3) Remove screw ②, then lift up and remove the BRACKET CLEANER ASS'Y ③.
4) Hold the BRACKET CLEANER ASS'Y ③ on a flat surface with your finger and turn the LEVER CLEANER ASS'Y ④ 35° to 40° clockwise, then lift up the LEVER CLEANER ASS'Y and remove it.
5) Remove the special washer ⑤, then remove the ROLLER CLEANER ASS'Y ①.

2. Remounting

1) Mount the ROLLER CLEANER ASS'Y ① and the special washer ⑤ to the axle ⑥ of the LEVER CLEANER ASS'Y.
Mount the ROLLER CLEANER ASS'Y ① so that the mark shown in Fig. A faces up. If the mark is down, noise may occur.
2) Mount the SPRING COIL ⑧ and the LEVER CLEANER ASS'Y ④ to the axle ⑦ of the BRACKET CLEANER ASS'Y. At the same time, hook the SPRING COIL ⑧ into the hole ⑨ of the LEVER CLEANER ASS'Y and the bent part ⑩ of the BRACKET CLEANER ASS'Y. "A part" of the LEVER CLEANER ASS'Y should be under "B part" of the BRACKET CLEANER ASS'Y.
3) Attach the BRACKET CLEANER ASS'Y ③ to the screw hole ⑫ with screw ②. Before tightening screw ②, insert axle ⑯ into hole ⑪ of the BRACKET CLEANER ASS'Y on a flat surface with your finger and axle ⑦ into hole ⑬ to match positions. Pin ⑭ of the LEVER CLEANER ASS'Y should run along the circumference of the MAIN CAM ⑮ so that the MAIN CAM will not come off.
4) The upper side of the lower drum should be within approx. 2mm from the lower side of the ROLLER CLEANER ASS'Y as shown in Fig. B.
5) Mount the PRE-AMP BRACKET and the COMPL VP-1.



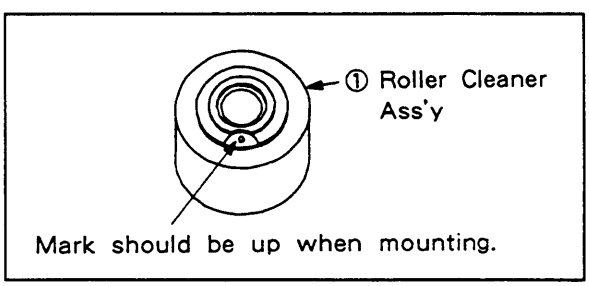


Fig. A

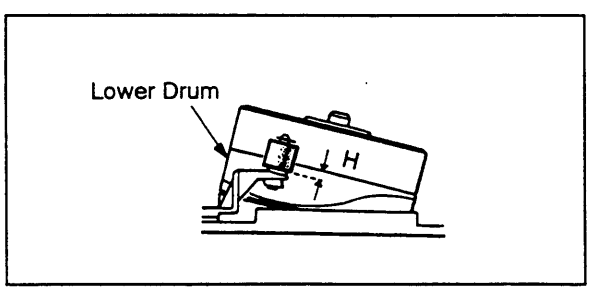
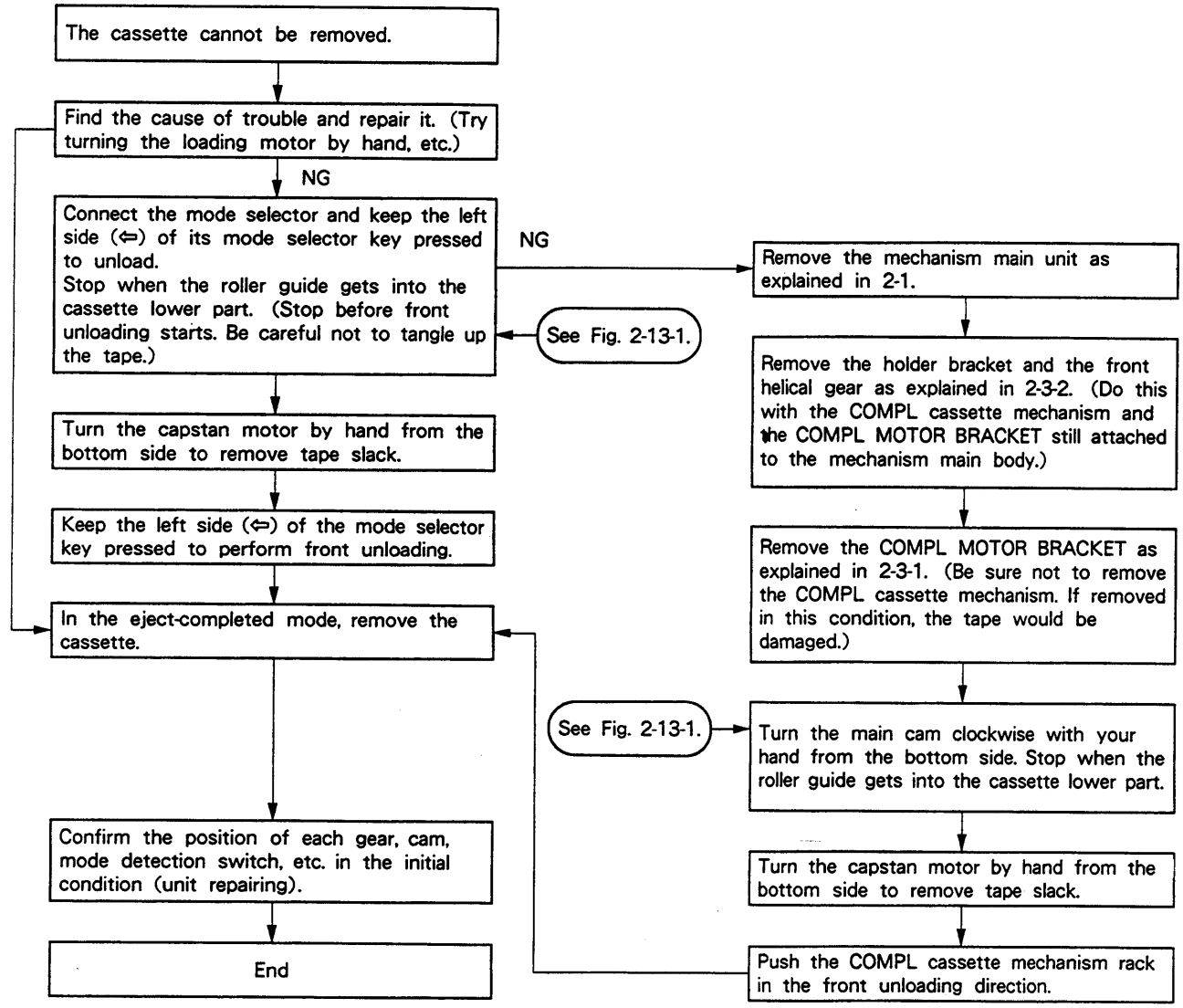


Fig. B

Fig. 2-12. Auto Head Cleaning Mechanism

2-13. HOW TO PROCEED WHEN THE CASSETTE CANNOT BE REMOVED


The cassette cannot be removed.
Find the cause of trouble and repair it. (Try turning the loading motor by hand, etc.)
NG
Connect the mode selector and keep the left side (⇦) of its mode selector key pressed to unload.
Stop when the roller guide gets into the cassette lower part. (Stop before front unloading starts. Be careful not to tangle up the tape.)
NG
See Fig. 2-13-1.
Turn the capstan motor by hand from the bottom side to remove tape slack.
Keep the left side (⇦) of the mode selector key pressed to perform front unloading.
In the eject-completed mode, remove the cassette.
Confirm the position of each gear, cam, mode detection switch, etc. in the initial condition (unit repairing).
End
Remove the mechanism main unit as explained in 2-1.
Remove the holder bracket and the front helical gear as explained in 2-3-2. (Do this with the COMPL cassette mechanism and the COMPL MOTOR BRACKET still attached to the mechanism main body.)
Remove the COMPL MOTOR BRACKET as explained in 2-3-1. (Be sure not to remove the COMPL cassette mechanism. If removed in this condition, the tape would be damaged.)
See Fig. 2-13-1.
Turn the main cam clockwise with your hand from the bottom side. Stop when the roller guide gets into the cassette lower part.
Turn the capstan motor by hand from the bottom side to remove tape slack.
Push the COMPL cassette mechanism rack in the front unloading direction.

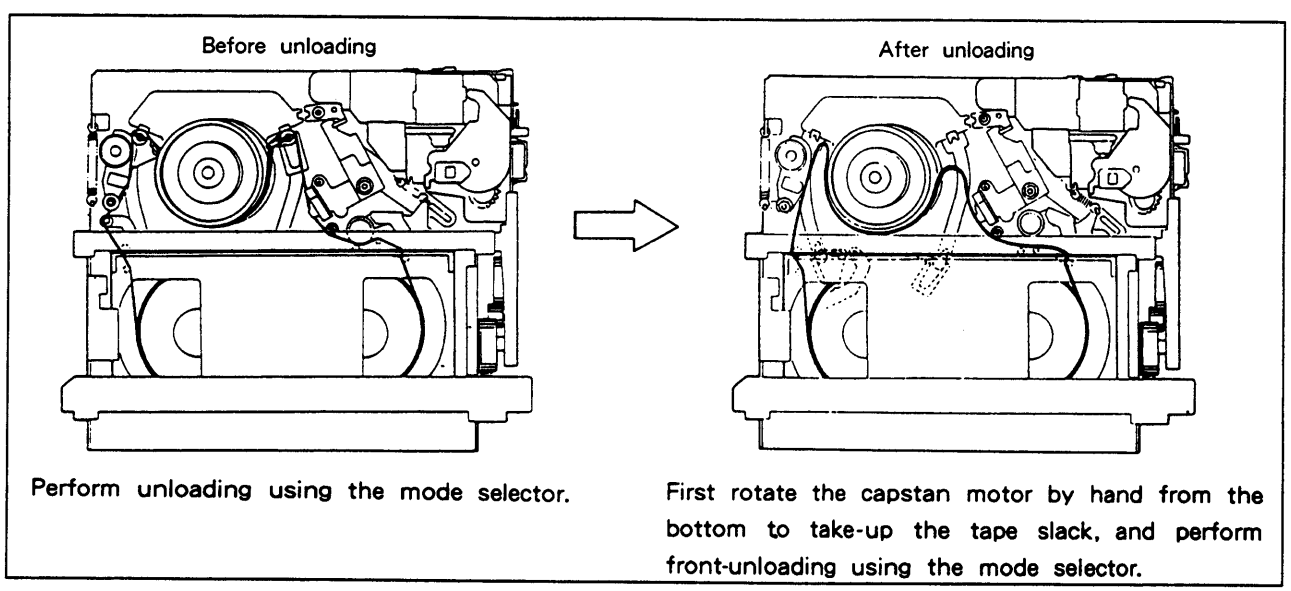

Before unloading
After unloading
Perform unloading using the mode selector.
First rotate the capstan motor by hand from the bottom to take-up the tape slack, and perform front-unloading using the mode selector.

Fig. 2-13-1.

3. MECHANISM MAINTENANCE AND CHECKING

3-1. PERIODIC CHECKING AND MAINTENANCE ITEMS AND SERVICE JIGS

The following maintenance and periodic checking procedures are recommended to ensure proper operation, and to protect the tape from dirt and damage. Also, these procedures should always be followed after repairing the unit.

3-1-1. PERIODIC CHECK ITEMS

○ Cleaning ◎ Confirmation △ Lubrication

Part \ Usage Time (hours)		500	1000	1500	2000	2500	3000	3500	4000	4500	5000	Remarks
Tape Guide System	Tape running surfaces	○	○	○	○	○	○	○	○	○	○	
	ACE head	○	○	○	○	○	○	○	○	○	○	
	Drum (cylinder)	○	○	○	○	○	○	○	○	○	○	Head life depends heavily on operating conditions.
Drive System	Loading belt	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	
	Reel drive belt	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	
	Intermediate gear, pulley axles		△		△		△		△		△	Absolutely avoid oil on tape running surfaces.
	Capstan axles		△		△		△		△		△	
	Loading motor		◎		◎		◎		◎		◎	
Performance Check	Back tension torque		◎		◎		◎		◎		◎	50 ± 10 g-cm
	Brake system		◎		◎		◎		◎		◎	
	FF, REW, REV, PLAY torque		◎		◎		◎		◎		◎	FWD : 600 g-cm and over REW : 750 g-cm and over PLAY : 100 to 160 g-cm REV : 150 to 240 g-cm

Note: The back tension torque is the value that has been measured by the cassette torque meter (VHJ-0016). The torque of FF, REV, REW, and PLAY represent values measured when locked by the torque gauge. FF and REW are values 2 seconds after starting.

3-1-2. CLEANING

1. Drum (COMPL CYLINDER) and Video Heads (See Fig. 3-1-1.)

1) Wrap a chamois leather around your finger and moisten it with methyl alcohol.
2) Move the chamois leather to the left and right several times on the video head to clean it. There is also a video head on the opposite side, so clean it likewise. In Hi-Fi models, clean the audio head also.
3) Clean the tape path surface of the cylinder in the same way.

Note: Always turn power off before cleaning. Never move the chamois leather vertically or apply too much force to the head ; it may be damaged.

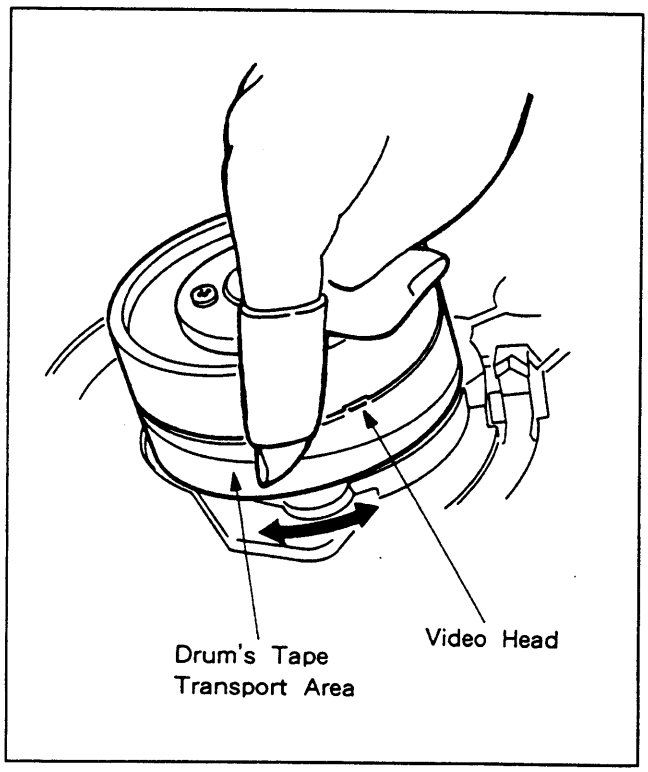


Fig. 3-1-1.

2. Cleaning of the Tape Guide System (See Fig. 3-1-2.)

Set the EJECT mode and clean the tape guide system (tape guides, impedance roller, FTE head, ACE head, pinch rollers, capstan axles, etc.) with a chamois leather moistened with methyl alcohol.

Note: Be sure that no oil, grease, etc. adhere to the chamois leather and that heads are not damaged.

3. Cleaning of the Drive System

Clean the drive system (loading belt, reel drive belt, pulley, supply reel table, etc.) with a soft cloth moistened with methyl alcohol.

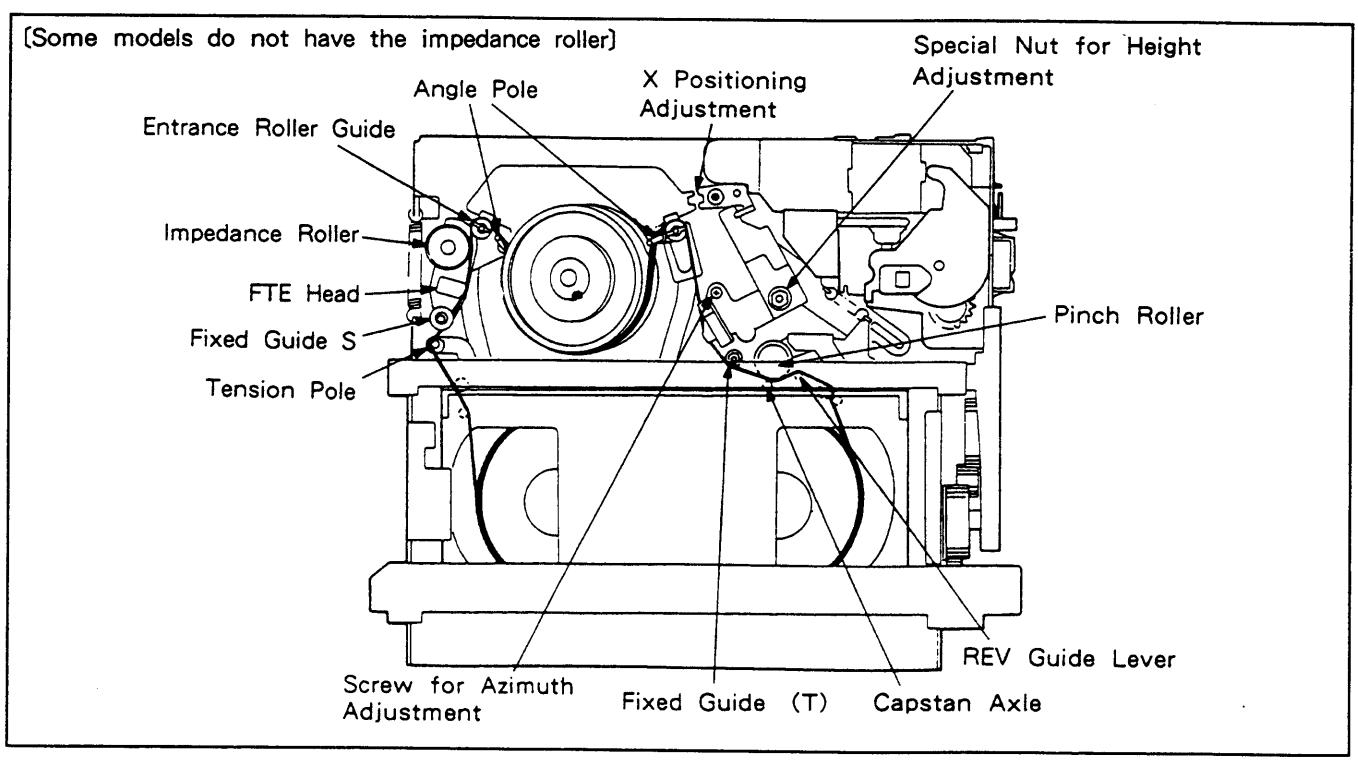
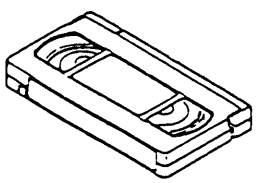


Fig. 3-1-2. Cleaning

3-1-3. Service Jigs

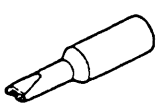
No.	Jig	Jig No.	Remarks
1	Alignment tape	VHJ-0008	SP colour bar, 1kHz (normal)
2	Alignment tape	VHJ-0009	SP monoscope, 7kHz (normal)
3	Alignment tape	VHJ-0052	LP monoscope, 3kHz (normal)
4	Eccentric screwdriver	VHJ-0003	For tape path adjustment
5	Nut box	VHJ-0048	For fixed guide removal
6	Torque gauge	VHJ-0004	For reel take-up torque measurement
7	Cassette torquemeter	VHJ-0016	For back tension torque measurement
8	Position adjustment gauge	VHJ-0049	For position adjustment
9	Torque gauge screwdriver	VHJ-0014	For screw fastening torque adjustment
10	3mm dia. bit for torque screwdriver	VHJ-0045	Spare bit for the torque gauge screwdriver
11	Video head removing tool	VHJ-0041	For upper drum removal
12	Cassette stand plate gauge	VHJ-0001	For reel height adjustment
13	Mode selector with 26-pin flexible flat cable (VHJ-0064)	VHJ-0050	For mechanism mode selection and for connecting mode selector
14	26-pin flexible flat cable	VHJ-0064	For mode selector (VHJ-0050) connection
15	Mode selector relay board	VHJ-0092	Relay board for mode selector (For VR204NV)
16	Mode selector relay board	VHJ-0094	Relay board for mode selector (For VR182LV, VR194LV)
17	REV guide lever removing tool	VHJ-0073	REV guide lever removal

VHJ-0008, VHJ-0009, VHJ-0052



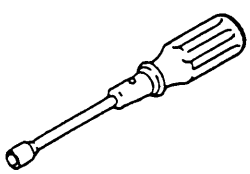
No. 1, 2, 3

VHJ-0003



No. 4

VHJ-0048

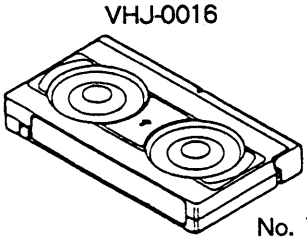


No. 5

VHJ-0004

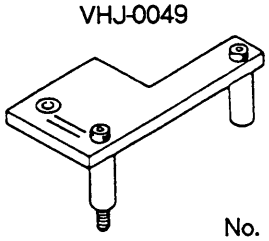
No. 6

VHJ-0016



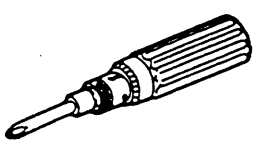
No. 7

VHJ-0049



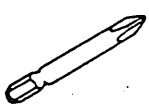
No. 8

VHJ-0014



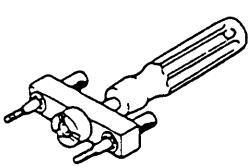
No. 9

VHJ-0045



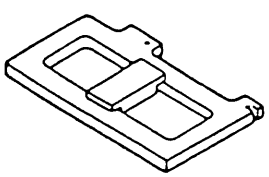
No. 10

VHJ-0041



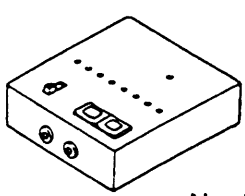
No. 11

VHJ-0001



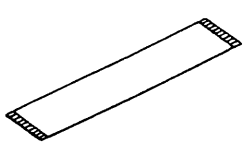
No. 12

VHJ-0050



No. 13

VHJ-0064

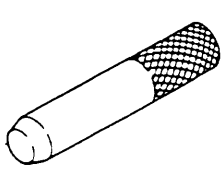


No. 14

VHJ-0092, VHJ-0094

No. 15, 16

VHJ-0073



No. 17

3-2. MODE SELECTOR (VHJ-0050) HANDLING INSTRUCTIONS

The mode selector drives the loading motor of the mechanism with its internal batteries (UM-2 × 4 = 6V), using LEDS to indicate the mode (EJECT, INITIAL, BRAKE, STOP/REW/FWD, STILL, PLAY, IDLER, REV) simultaneously with EJECT⇔REV mode changes.
Instead of the internal batteries, an external DC 6V power supply can also be used.

3-2-1. PART NAMES (See Fig. 3-2-1.)

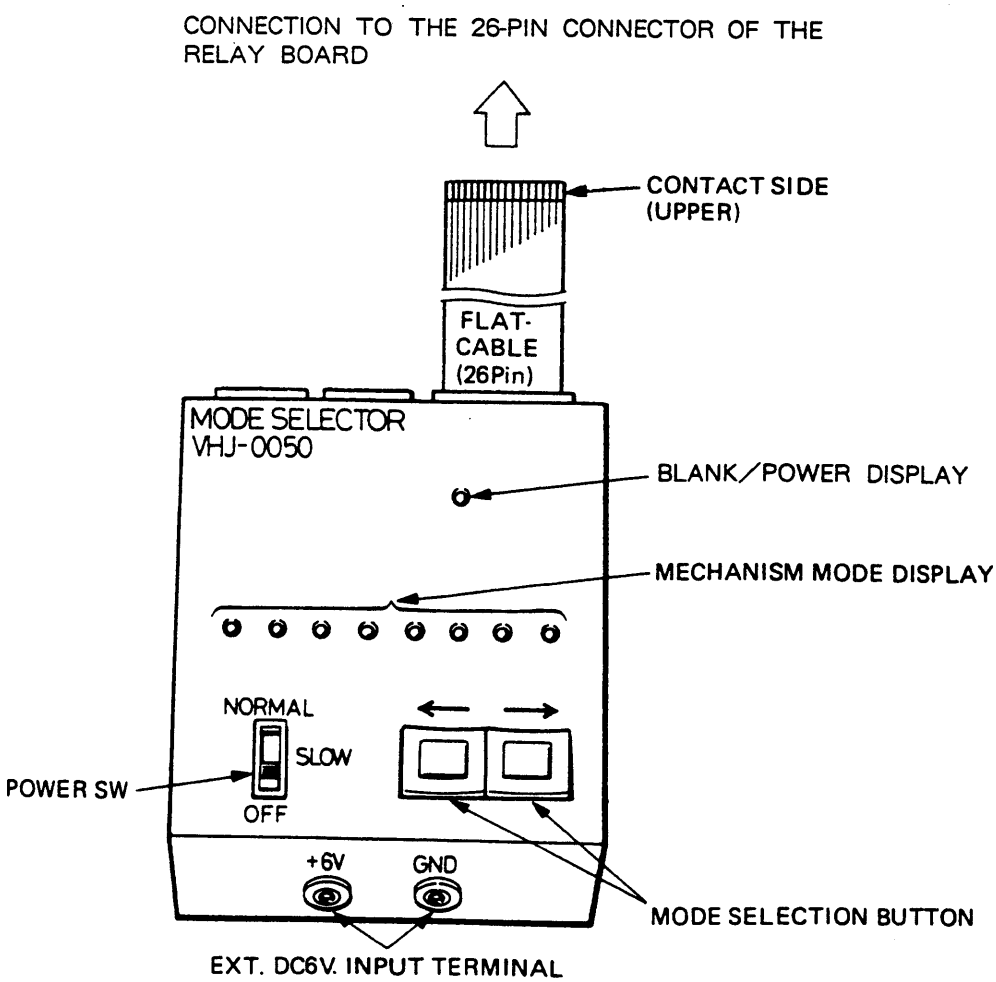


Fig. 3-2-1.

3-2-2. CONNECTION METHOD

The relay board in the Hifi model is different from that used in the monaural model. The gilt side of the MC-2 board of the HiFi model is marked "T-HiFi" while that of the monaural model is marked "T-MONO". Use the following exclusive relay board for each.

[For model VR204NV]

1) Remove the 24-pin flat cable extending from the COMPL MC-2 board connector (CN811) from the connector of the system control circuit board, and connect it to the 24-pin connector of the mode selector relay board (VHJ-0092).
2) Connect the 26-pin flexible flat cable of the mode selector (VHJ-0050) provided between the mode selector body and the 26-pin connector of the mode selector relay board (VHJ-0092).

[For model VR182LV and VR194LV]

1) Remove the 29-pin flexible flat cable extending from the COMPL MC-2 board connector (CN811) from the connector of the system control circuit board, and connect it to the 29-pin connector of the mode selector relay board (VHJ-0094).
2) Connect the 26-pin flexible flat cable of the mode selector (VHJ-0050) provided between the mode selector body and the 26-pin connector of the mode selector relay board (VHJ-0094).

Note: Care should be taken to avoid mistaking the direction of the contacting side when connecting the flexible flat cable.

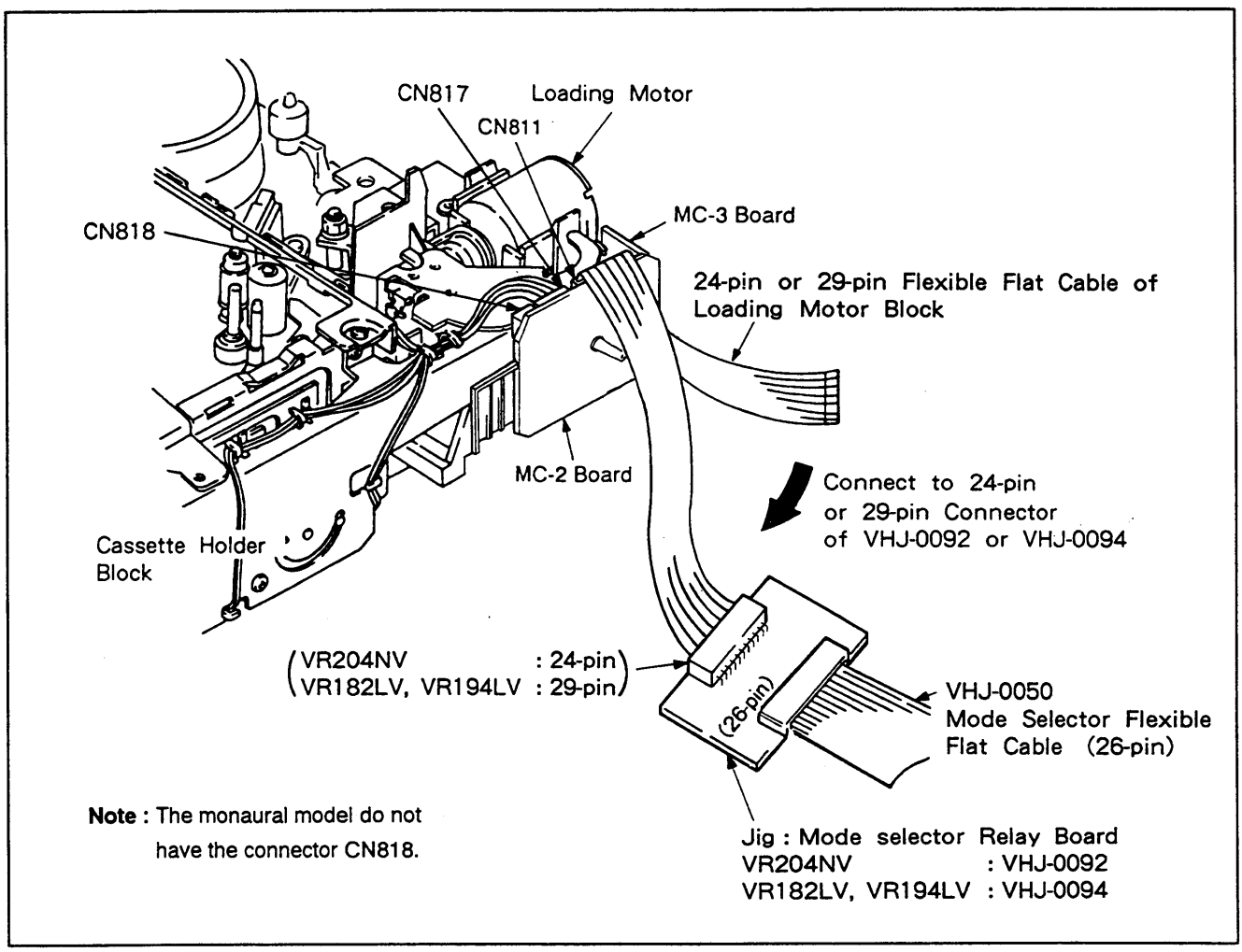


Fig. 3-2-2. Connection

3-2-3. HANDLING METHOD

1) The mode changes in sequence of EJECT, INITIAL, BRAKE, STOP/REW/FF, STILL, PLAY, IDLER, REV when the right side (⇨) of the mode selector button is pressed.
2) To change the mode from REV to EJECT, press the left side (⇨) of the mode selector button to select the desired mode.
3) In the mid position of each mode during a shift to another mode, the "BLANK" LED lights. But the "PLAY", "IDLER", "REV" LEDs light between the EJECT mode and the INITIAL mode. Be sure, therefore, to check the mechanism body to see just what state the mechanism is in.
   Incidentally, if the mode selector is not connected to the mechanism, the "BLANK" LED lights to indicate the power is ON.
4) The SLOW position of the POWER switch makes relatively slow motions in comparison with the NORMAL position.

Note 1: The mode selector drives the loading motor only, not affecting the head drum motor and the capstan motor. When using the mode selector with a cassette loaded, turn the capstan motor manually to remove tape slackness, preventing tape entanglement.

Note 2: If the left side (⇦) of the mode selector (VHJ-0050) key is kept pressed with the COMPL cassette mechanism removed, it might get past the EJECT position, causing the front helical gear and the front worm gear to get disengaged.

In this condition, since the front helical gear will not turn even if the right side (⇨) of the mode selector key is pressed, rotate (push) the front helical gear clockwise by hand and engage it with the front worm gear. As there is a misalignment between the mechanism main body operation mode (indicated by the mode selector indicator lamps) and the front loading mechanism operation mode, keep the right side (⇨) of the mode selector key pressed until the front helical gear and the front loading gear of the front loading mechanism get back to the initial condition. (Refer to A and B in Fig. 2-3-2 of section 2-3-2. Loading Motor.)

When the front loading mechanism returns to the initial condition, the operation mode of the whole mechanism gets back to normal, matching the mode shown by the mode indicator lamps (mode EJECT would not be properly indicated during eject).

Sometimes, engagement of the front helical gear with the front worm gear is delayed. The mechanism main body gets too much ahead and the front loading mechanism mode cannot be switched to the initial condition. In that case, press the left side (⇦) of the mode selector key, setting the mechanism main body operation mode back to EJECT (rotation of the mode cam and the MAIN CAM stops).

Note 3: The mode indicator lamps show the mechanism operation mode, but the EJECT lamp may sometimes fail to indicate the actual mechanism operation mode.

When setting the mechanism to the EJECT or INITIAL mode for dismounting or reassembling, fine adjustment of each gear and cam, etc., and marking positions is required after the mode indicator lamp has lighted up. Do this with the mode selector switch in the SLOW position.

4. MECHANISM ADJUSTMENT

4-1. OPERATING THE MECHANISM WITH NO CASSETTE INSERTED (See Fig. 4-1-1.)

1) Attach black vinyl tape to the T. END and T. TOP sensors to prevent light from entering.
2) Push the TRAY LOCK LEVER in the direction of the arrow to maintain the unlocked condition. Release the lever just before the TRAY starts moving down.
3) In this condition, operation is possible in every mode. However, the following procedures are necessary to operate the unit in the REC, REW and R-SEARCH modes.

REC mode : Push the SAFETY SW LEVER to turn the SAFETY SWITCH (Erasure Prevention Switch) ON, then press the REC button. If the SAFETY SWITCH is not turned ON, the unit will enter the EJECT mode.

REW/R-SEARCH : After pressing the REW button, turn the TAKE-UP REEL ASS'Y by hand. Otherwise, the reel sensor will operate, setting into the INITIAL mode after 2 to 3 seconds.

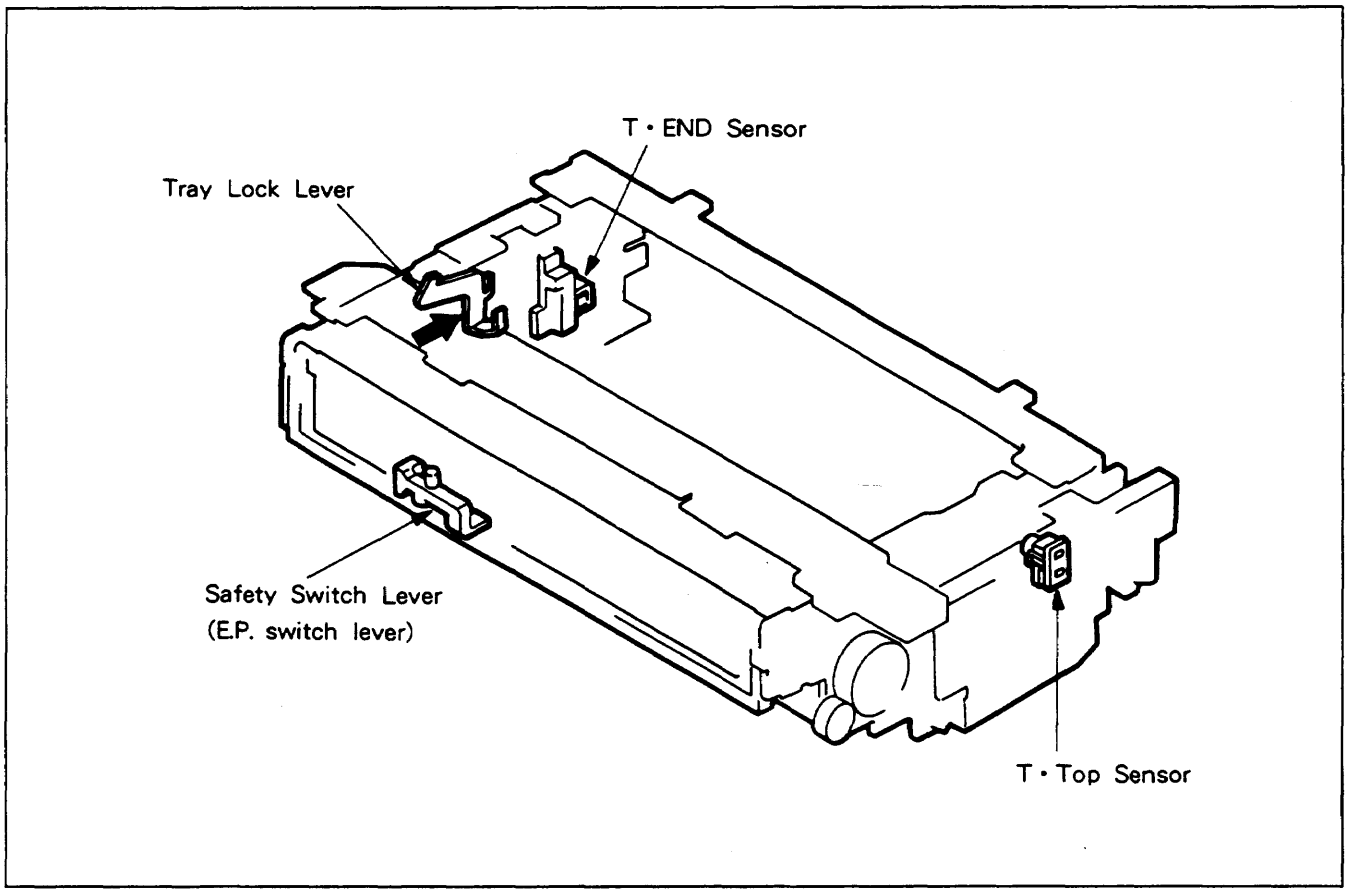


Fig. 4-1-1. Preparations for Adjustment

4-2. REEL TABLE HEIGHT ADJUSTMENT AND TORQUE CHECK

4-2-1. REEL TABLE HEIGHT (See Fig. 4-2-1.)

If the SUPPLY REEL ASS'Y or the TAKE-UP REEL ASS'Y is replaced, it will be necessary to adjust the REEL TABLE height.

(1) Remove the COMPL CASSETTE MECHANISM as instructed in 2-2-1.
(2) Attach the cassette stand plate gauge (VHJ-0001) and slide the gauge in the direction of the arrows.
(3) Confirm that, when the gauge stops, the REEL TABLEs are not in contact with surface A of the plate and are in contact with surface B.
(4) If the REEL TABLE is in contact with surface A, remove a spacer and check again.
(5) If the REEL TABLE is not in contact with surface B, add a spacer and check again.
(6) Remove the cassette stand plate gauge.
(7) Set the EJECT mode with the mode selector.
(8) Mount the COMPL CASSETTE MECHANISM as instructed in 2-2-1.

Note:

- Adjust the reel table height by adding or removing spacers (0.13t, 0.25t, 0.3t, 0.4t and 0.5t) as appropriate so that the height meets the specifications. Use the same method for both the TAKE-UP REEL TABLE and the SUPPLY REEL TABLE.
  (The 0.5t washer is included as the standard washer for the SUPPLY REEL ASS'Y. The 0.4t washer is included as the standard washer for the TAKE-UP REEL ASS'Y.)
- If the height of the reel table is not within the specified value, the tape edge might be damaged as a result, or the tape path adjustment might not be possible to make.

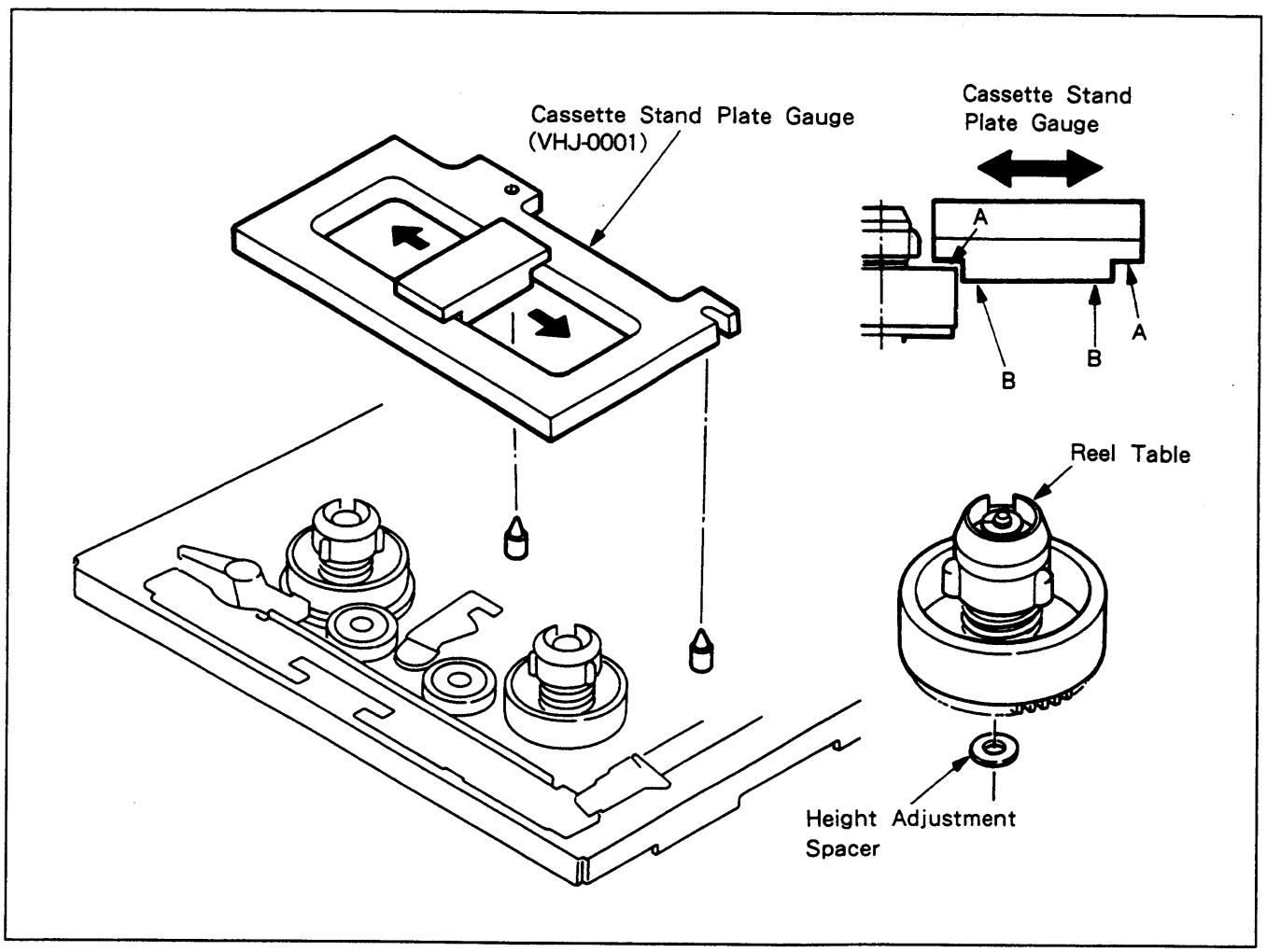


Fig. 4-2-1. Reel Table Height Adjustment

4-2-2. TORQUE CHECK (See Fig. 4-2-2.)

1) Set the unit to operating condition without a cassette inserted as instructed in 4-1.
2) Measure the SUPPLY REEL TABLE torque in the REW mode, and confirm that it is 750 g-cm or more. Perform this measurement keeping the torque gauge in a fixed position with your hand (locked torque).
3) Measure the TAKE-UP REEL TABLE torque in the F.FWD mode, and confirm that it is 600 g-cm or more (locked torque).
4) Measure the TAKE-UP REEL TABLE torque in the playback mode (SP tape speed), and confirm that it is within 100 through 160 g-cm (locked torque).
5) Measure the SUPPLY REEL TABLE torque in the REV (R-SEACH) mode, and confirm that it is within 150 through 240 g-cm (locked torque).
6) After confirming that torque readings are within the specifications for each mode, check the following :
   ⓐ Dirt on the capstan motor and the REEL PULLEY groove.
   ⓑ Deterioration of the REEL DRIVE BELT.
   ⓒ Deterioration of the FRICTION GEAR ASS'Y felt (torque during playback).
   ⓓ Wear and damage of the COMPL CLUTCH MECHANISM and the reel drive system gears.

Note 1: Items ⓑ, ⓒ and ⓓ require replacement if found defective.

Note 2: The measured value of torque during FF and REW represents the value 2 seconds after starting.

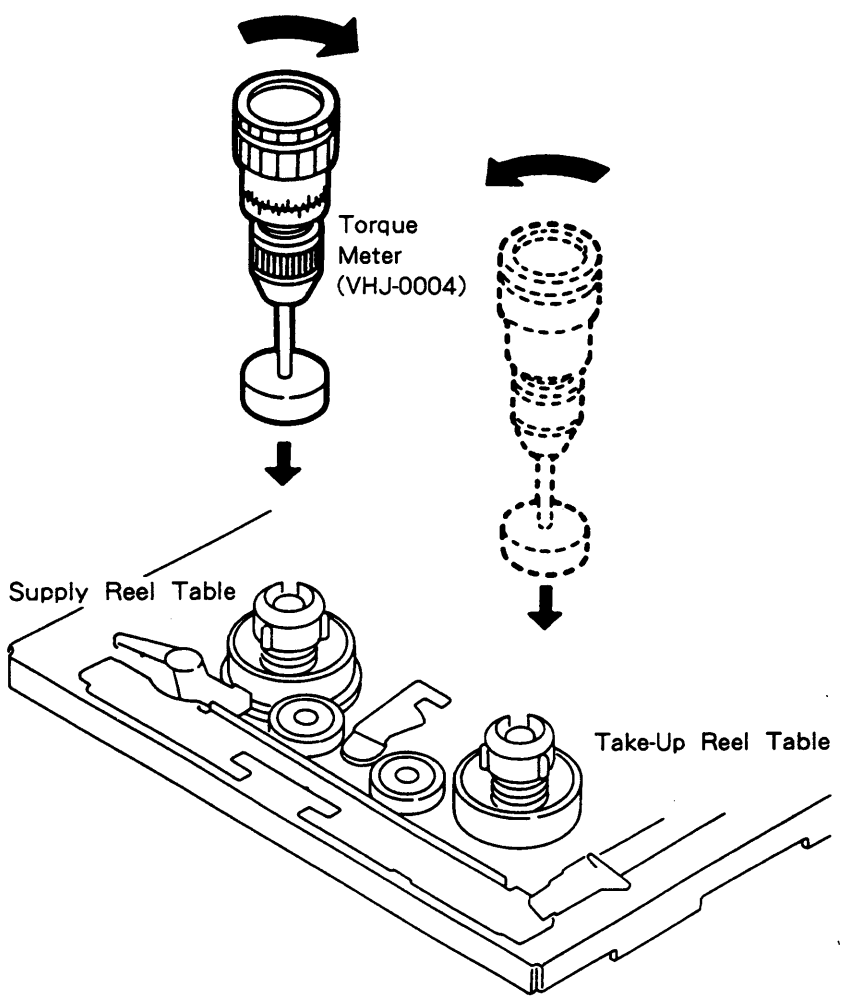


Fig. 4-2-2. Checking REW/FF/PLAY Torque

4-3. TENSION POLE (BACK TENSION GUIDE) POSITION ADJUSTMENT AND BACK TENSION TORQUE CHECK

4-3-1. TENSION POLE (BACK TENSION GUIDE) POSITION ADJUSTMENT (See Fig. 4-3-1.)

1) Remove the COMPL CASSETTE MECHANISM as instructed in 2-2-1.
2) Set the PLAY mode with the mode selector (VHJ-0050).
3) Attach the position adjustment gauge (VHJ-0049) ①.
4) Confirm that the tension pole ② is within the position adjustment gauge frame.
5) In case the tension pole is not within the above-mentioned frame, adjust it by loosening the screw ④ a little and changing the mounting position of the BAND HOLDER ⑤ in the direction of the arrow Ⓐ.
6) Remove the position adjustment gauge ①.
7) Set the EJECT mode with the mode selector.
8) Mount the COMPL CASSETTE MECHANISM as instructed in 2-2-1.
9) Confirm that back tension torque is within 50 ± 10 g-cm, as instructed in 4-3-2 below.

4-3-2. BACK TENSION TORQUE CHECK (See Fig. 4-3-1.)

1) Attach the cassette torquemeter (VHJ-0016) and set the PLAY mode.
2) Confirm that back tension torque is within 50 ± 10 g-cm.
3) In case back tension torque does not meet the above specification, proceed as follows :

ⓐ Clean the portion where the brake band (BAND HOLDER ASS'Y) ⑦ of the SUPPLY REEL ASS'Y ⑥ makes contact.

ⓑ Confirm that the brake band of the BAND HOLDER ASS'Y ⑦ is not worn and that it is clean. If wear or dirt is found, replace the band holder assembly ⑦ as instructed in 2-7-3.

ⓒ Replace the TENSION LEVER ASS'Y SPRING COIL ⑧.

4) Do the Tension Pole Position Adjustment after completing ⓐ, ⓑ and ⓒ.

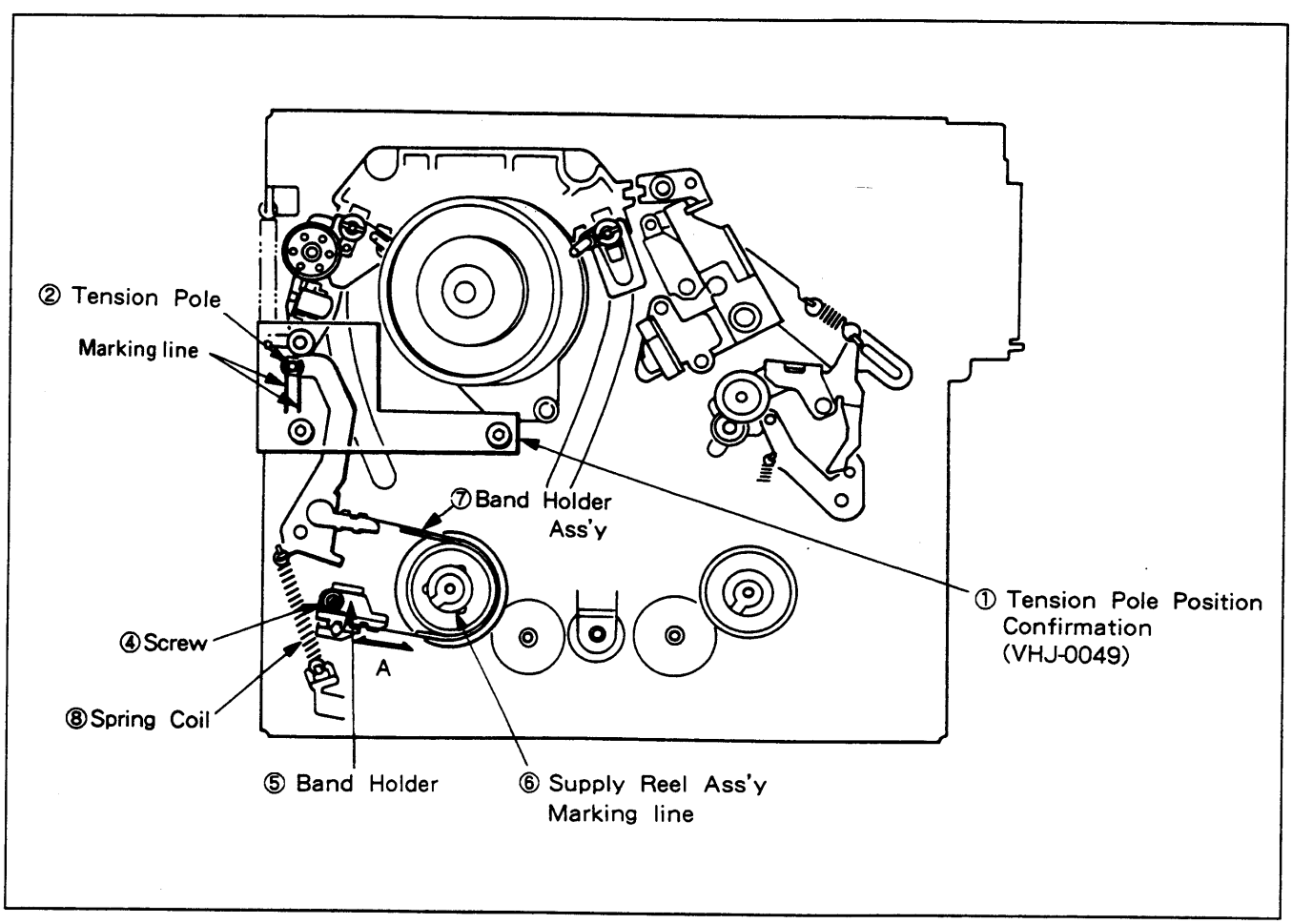


Fig. 4-3-1. Tension Pole Positioning Adjustment

4-4. TAPE PATH ADJUSTMENT

The tape path mechanism is precisely adjusted at the factory. Normally no readjustment is required, but checking and/or adjustment is necessary when parts of the tape path mechanism among those shown in the figure below (See Fig. 4-4-1.) have been removed or replaced after a long period of use.
This operation consists of adjusting the various guides so that the tape drawn out from the supply reel runs smoothly along the DRUM (CYLINDER) lead surface. A way of grasping the tape path condition by electronic means is monitoring the video head output envelope waveform with an oscilloscope. However, the fact that visual observation is essential in order to know whether the tape is running through the various guides in a smooth and natural way should be kept in mind when checking and adjusting.
Also remember that the position of tape guides is not greatly affected by the replacement of the UPPER DRUM (UPPER CYLINDER) or the COMPL DRUM (COMPL CYLINDER), provided that it is correctly performed, and that only the replaced parts should be adjusted after replacing a tape guide or COMPL HEAD BRACKET, since the position of the other tape guides shall not change considerably.

4-4-1. PREPARATIONS FOR ADJUSTMENT

(1) Clean the tape transport surfaces. (See Fig. 4-4-1.)
(2) Connect the oscilloscope. Connect the channel 1 probe to the envelope waveform test point, and the channel 2 probe to the SW25 (RF SW P) test point. During adjustment, apply a trigger to the L side of SW25 (RF SW P) in order to monitor the waveform output from channel 1 of the video head.

Note: Since oscilloscope connection points differ according to the model, refer to the "TEST POINT FOR TAPE PATH ADJUSTMENT" in the ELECTRICAL CIRCUIT ADJUSTMENT.

(3) Use a dentist's mirror for visual observation of the tape path condition.
(4) Use an eccentric driver (VHJ - 0003) for adjustment of the guide rollers.
(5) When adjusting the height of the guide rollers or the COMPL HEAD BRACKET, turn the special nut or the upper flange clockwise to push the tape downward, and counterclockwise to make the tape rise up.
(6) Do not use damaged cassette tapes for tape path adjustment.

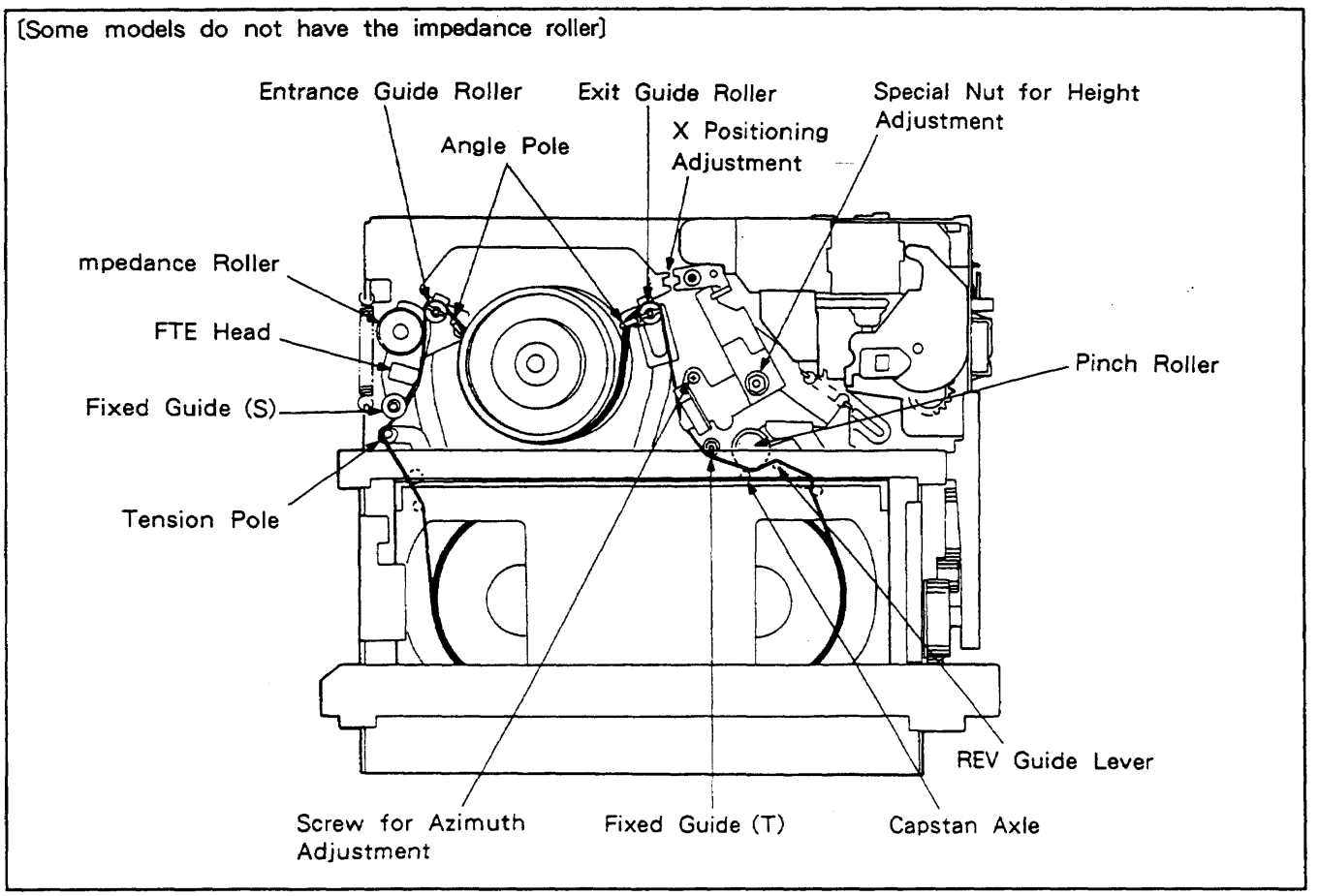


Fig. 4-4-1. Preparation for Adjustment

4-4-2. ADJUSTMENT BY VISUAL OBSERVATION AFTER GUIDE ROLLER OR COMPL HEAD BRACKET REPLACEMENT

Perform this adjustment after removing or replacing any of the above parts. Only for the replaced or removed parts, play back an alignment tape (VHJ-0009) beforehand and adjust height by visual observation.

(1) Guide Rollers (See Fig. 4-4-2.)
The tape should not be curled by the guide roller upper and lower flanges. It should also run smoothly, without moving up and down on the DRUM (CYLINDER) lead surface.

Note: An excessive guide roller pressure may cause tape damage.

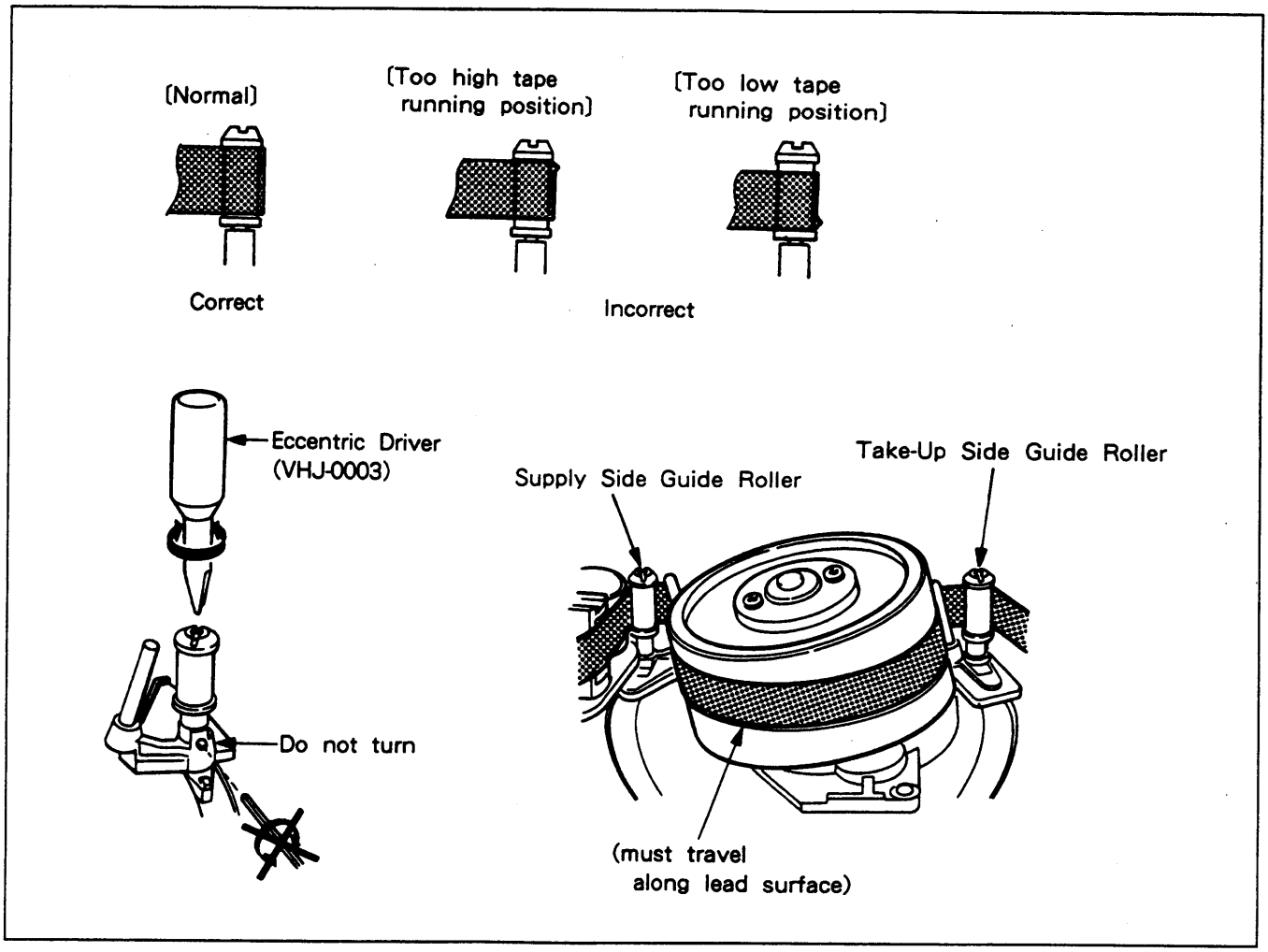


Fig. 4-4-2. (1) Pre-set for Guide Roller

(2) COMPL Head Bracket (ACE Head) (See Fig. 4-4-3.)
Adjust the ACE Head Height Adjustment nut so that the tape edge runs between the audio head upper end and the control head lower end. Gaps A and B should be of about the same width. Since at this point it is only required that the control signal is picked up and the servo circuit works normally, no adjusting screws except the COMPL HEAD BRACKET special nut should be touched.

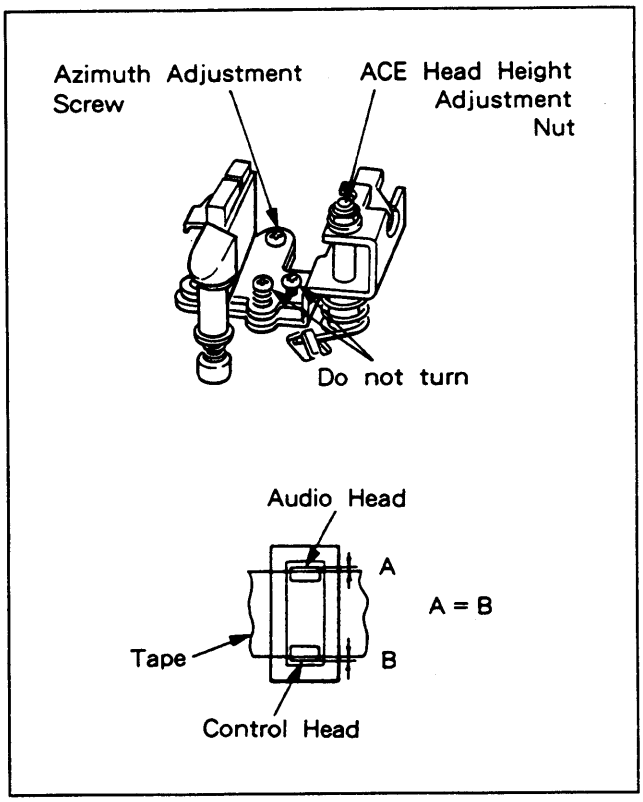


Fig. 4-4-3. (2) Pre-set for Compl Head Bracket

4-4-3. TAPE PATH CHECK OF ENTRANCE SIDE FIXED GUIDE (S) (See Fig. 4-4-4.)

The fixed guide (S) of the entrance side does not require adjustment in this mechanism.
Confirm that the lower edge portion of the tape is running along the lower flange of the entrance side fixed guide (S).
The tape should not be curled by the entrance side fixed guide (S) upper and lower flanges.

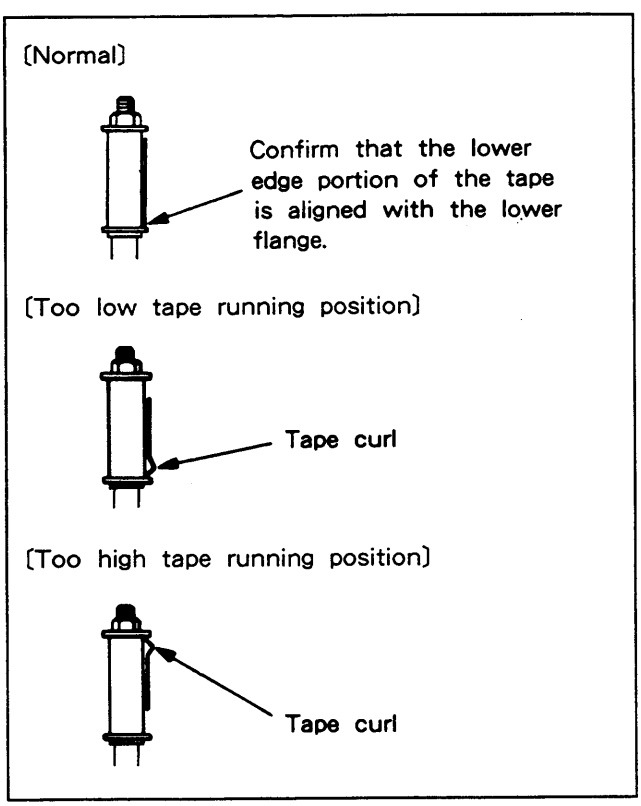

[Normal]
Confirm that the lower edge portion of the tape is aligned with the lower flange.
[Too low tape running position]
Tape curl
[Too high tape running position]
Tape curl

Fig. 4-4-4. Fixed Guide (S)

4-4-4. GUIDE ROLLER ADJUSTMENT (See Fig. 4-4-5.)

1) Play back the alignment tape (VHJ-0009), press the tracking control key and adjust the envelope waveform to the maximum level.
2) Loosen the supply side and take-up side guide rollers by rotating them counterclockwise, then rotate them clockwise alternately until a flat video output waveform is obtained.
3) Confirm that the envelope waveform is not deformed. Check visually that no curling occurs at the guide roller upper and lower flanges.
4) Press the tracking control key and set the envelope waveform level to approx. 50% of the maximum. In this condition, confirm whether the envelope waveform is flat. It will show valleys or peaks at the first half (supply side) or second half (take-up side) if the tape running position is too high or too low.
   In case there is unevenness in the first half (supply side), adjust the entrance side guide roller. If the second half (take-up side) shows trouble, adjust finely the take-up side guide roller.

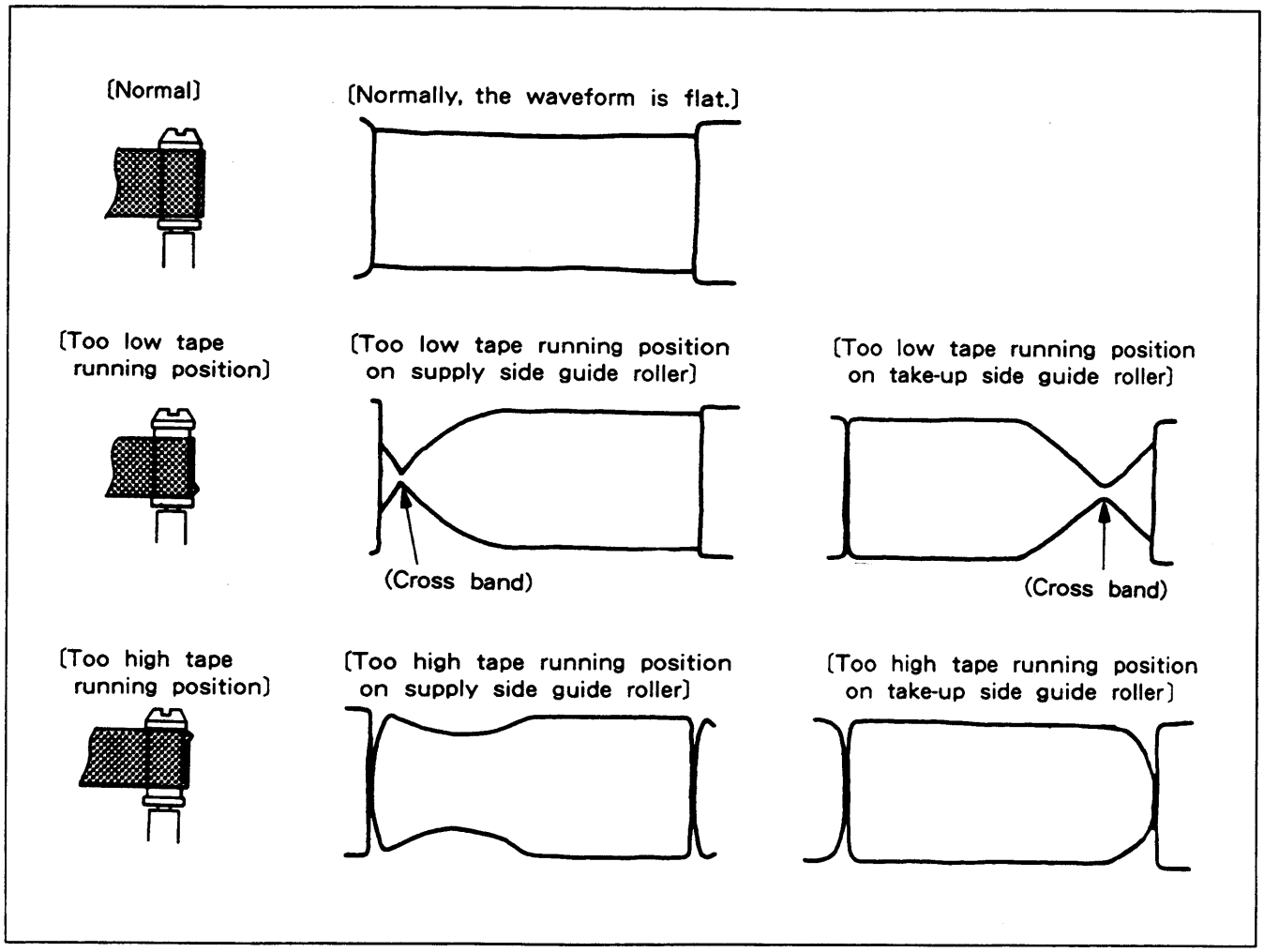

(Normal)
(Normally, the waveform is flat.)
(Too low tape running position)
(Too low tape running position on supply side guide roller)
(Cross band)
(Too low tape running position on take-up side guide roller)
(Cross band)
(Too high tape running position)
(Too high tape running position on supply side guide roller)
(Too high tape running position on take-up side guide roller)

Fig. 4-4-5. Guide Roller Adjustment

4-4-5. TAPE PATH CHECK OF EXIT SIDE FIXED GUIDE (T) (See Fig. 4-4-6.)

The fixed guide (T) of the exit side does not require adjustment in this mechanism.
Confirm that the lower edge portion of the tape is running close to the lower flange of the exit side fixed guide (T).
The tape should not be curled by the exit side fixed guide (T) upper and lower flanges.

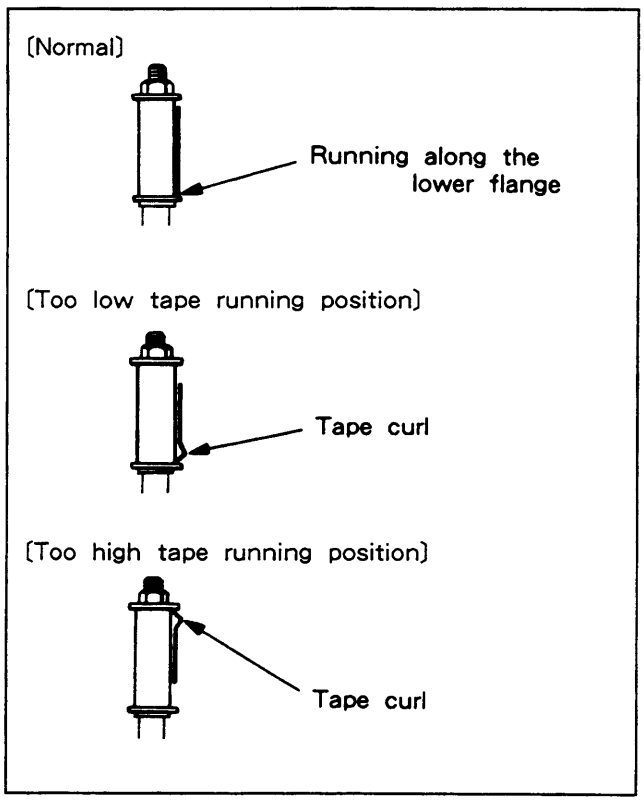


Fig. 4-4-6. Fixed Guide (T)

4-4-6. COMPL HEAD BRACKET(ACE HEAD) ADJUSTMENT

(1) Height Adjustment and Azimuth Adjustment. (See Fig. 4-4-7.)

1) Load the alignment tape (VHJ-0009) and set the PLAY mode.
2) Monitor the audio output waveform with the oscilloscope.
3) Rotate the azimuth adjustment screw until the audio output waveform amplitude is maximum.
4) After loosening the ACE head height adjustment special nut, rotate it slowly clockwise until amplitude of the audio output waveform is maximum, then adjust it finely clockwise to the point just before the said waveform amplitude begins to decrease.
5) Rotate the azimuth adjustment screw until amplitude of the audio output waveform is maximum.
6) Confirm that the audio output waveform amplitude does not fluctuate.

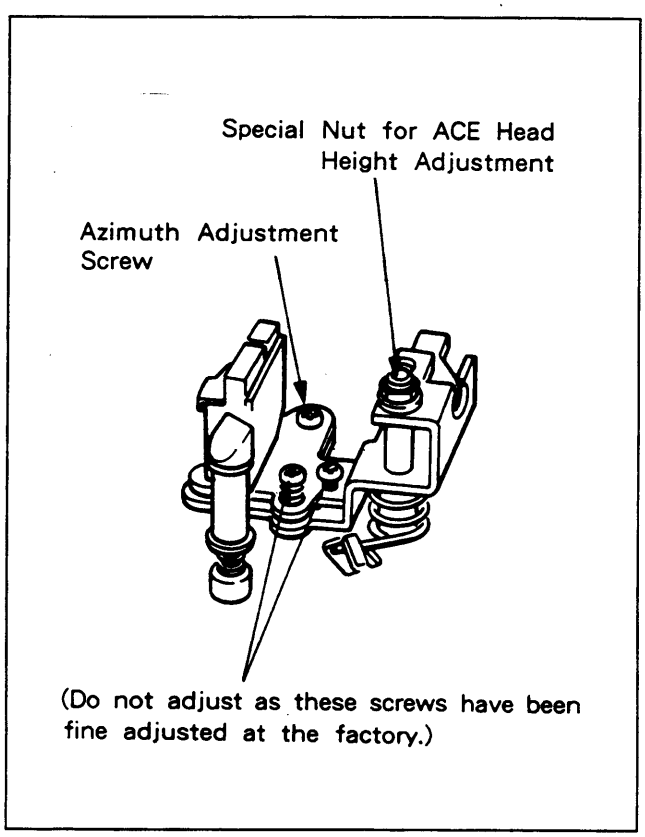

Special Nut for ACE Head Height Adjustment
Azimuth Adjustment Screw
(Do not adjust as these screws have been fine adjusted at the factory.)

Fig. 4-4-7. Compl Head Bracket

(2) Tracking (X Value) Adjustment (See Fig. 4-4-8.)

1) Load the alignment tape (VHJ-0009).
2) Referring to the "TAPE PATH ADJUSTMENT" section of the corresponding Service Manual (Electrical Adjustment), set tracking to the center position.
3) Rotate the stopper bracket fixing screw 180° counterclockwise.
4) Set the PLAY mode and monitor the video head output envelope waveform.
5) Adjust the stopper bracket position so that amplitude of the envelope waveform becomes maximum at the tracking center. Confirm that the envelope waveform amplitude changes by the same amount when shifting the tracking center by pressing the tracking plus (+) and the tracking minus (—) buttons.
6) Tighten the stopper bracket fixing screw.
7) (Model for LP mode tape speed capability)
   Play back the alignment tape (VHJ-0052) and set the tracking to the center using a tracking control button.
   Then confirm that the played back picture on the screen is normal. If not, make readjustment by referring to items 1) through 7). To readjust, play back VHJ-0009 and finely adjust the position of the stopper bracket within the range in which the amplitude of the envelope waveform can be held to a maximum.
8) Do servo circuit PB PHASE (Switching position) adjustment.

Note: For models equipped with auto tracking, always set to the manual tracking mode before adjustment. To confirm the tracking center position, press the tracking buttons (+,—) and observe the front panel clock display. It will read "T − : −" at the tracking center, "T − :, T − − :" when keeping the tracking minus (—) button pressed, and "T : −, T : − −" when keeping the plus (+) button pressed. The time indication will be restored 2 to 3 seconds after the tracking buttons are released.

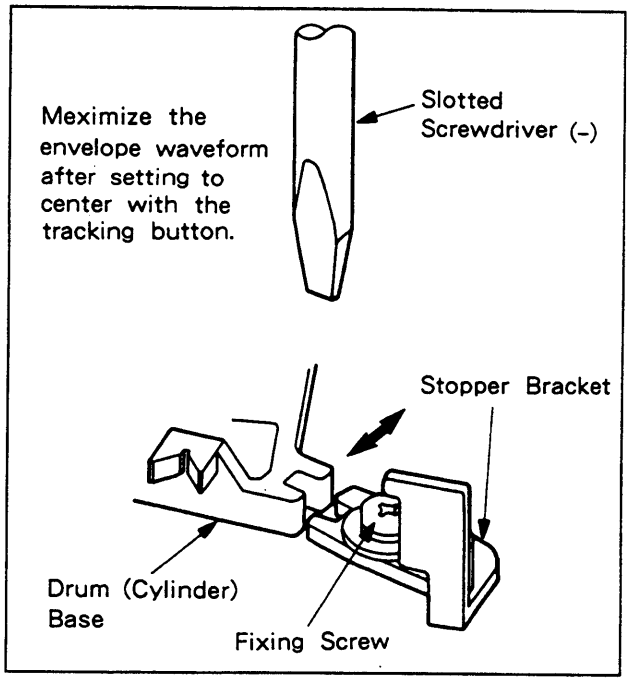

Meximize the envelope waveform after setting to center with the tracking button.
Slotted Screwdriver (-)
Stopper Bracket
Drum (Cylinder) Base
Fixing Screw

Fig. 4-4-8.

4-4-7. CHECKING AFTER ADJUSTMENT

Tape running may show a slight change depending upon the type of the cassette tape (thick or thin tape), the start, middle, or end of cassette tape winding, etc. After performing the tape path adjustment with use of an alignment tape, be sure to check the following points. Incidentally, the alignment tape to be used should be a good quality E-180 or E-240 cassette without any damage to it.

(1) Try to play back the alignment tape (VHJ-0009) and confirm that the envelope waveform rises immediately and that there is no fluctuation in the envelope waveform and the audio output waveform.

(2) Load a E-180 cassette tape and start the recording operation in the standard mode. 1 kHz should be fed to the audio input terminal when recording. After recording, the following points should be checked.

1. When the recorded portion is played back, the envelope waveform rises immediately, and no fluctuation in the envelope waveform is observed. Also, no speed drop occurs during the first half period or the last half period. Further, check to be sure that no fluctuation occurs in the audio waveform. Also confirm that neither tape curling or derailing is caused on the upper or lower flange and on the read side of the drum.
2. Confirm that no tape curling or derailing occurs in the upper or lower flange of each tape guide and the read side of the drum during each mode of operation, namely, FF, REW, F. SEARCH, and R. SEARCH.
3. Confirm that the envelope waveform rises immediately after changing the mode directly to PLAY from each mode – FF, REW, F. SEARCH, R. SEARCH, or POWER OFF (INITIAL) – and that no tape curling or derailing occurs in the upper or lower flange of each tape guide and on the read side of the drum.

(3) Load a E-240 cassette tape and do a recording operation in the SP mode. 1 kHz should be fed to the audio input terminal when recording. Now, confirm that the envelope waveform rises immediately upon starting the playback of the recorded portion, and that neither fluctuation in the envelope waveform nor a speed drop occurs during the first half period or the last half period. Also confirm that no tape curling or derailing is caused in the upper or lower flange of each tape guide and on the drum lead surface.

[Some models do not have the impedance roller]

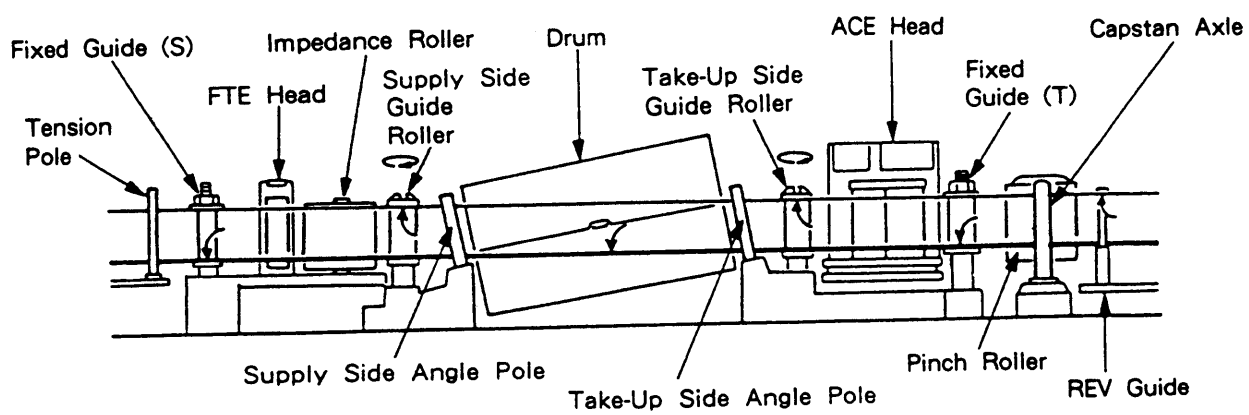


Fig. 4-4-9

2. If damage in the form of a sawtooth or a streak is found on the tape edge :
   1) Check if a large amount of magnetic particles is adhered to the exit-side guide roller. If magnetic particles cannot be removed in spite of repeated cleaning, the guide roller must be replaced.
   2) Confirm if the tape is held too tightly by the exit-side guide roller, or if the last half of the envelope waveform is flat. If the tape is found to be held too tightly, readjustment should be made by referring to 4-4-4.
   3) Recheck if the damage is still caused on the E-240 tape.
      If similar damage is found on the tape, the exit-side guide roller should be loosened about 20° counterclockwise.
   4) Check once again that no fluctuation is caused in the envelope waveform or the audio waveform by loosening the exit-side guide roller. To do this, record and play back on the E-240 cassette tape.

(5) Record for 60 seconds in the SP mode at the near end of the E-240 cassette tape. Play back the recorded portion and repeat the F. SEARCH ↔ R. SEARCH ten times, following which a check should be made to see if damage is still done to the tape edge.
If damage in the form of a sawtooth or a streak still occurs on the tape edge by the upper flange of the entrance side guide roller, proceed with the steps below.
1. Check if a large amount of magnetic particles is adhered to the entrance-side guide roller. If the magnetic particles cannot be removed in spite of repeated cleaning, the guide roller must be replaced with a new one.
2. Confirm if the tape is held too tightly by the entrance-side guide roller, or if the first half of the envelope waveform is flat. If the tape is found to be held too tightly, readjustment should be made by referring to 4-4-4.
3. Recheck if the damage is still caused on the E-240 tape.
   If damage is still found on the tape, the entrance-side guide roller should be loosened about 20° counterclockwise.
4. Check once again that no fluctuation is caused in the envelope waveform or the audio waveform by loosening the entrance-side guide roller. To do this, record and play back on the E-240 cassette tape.

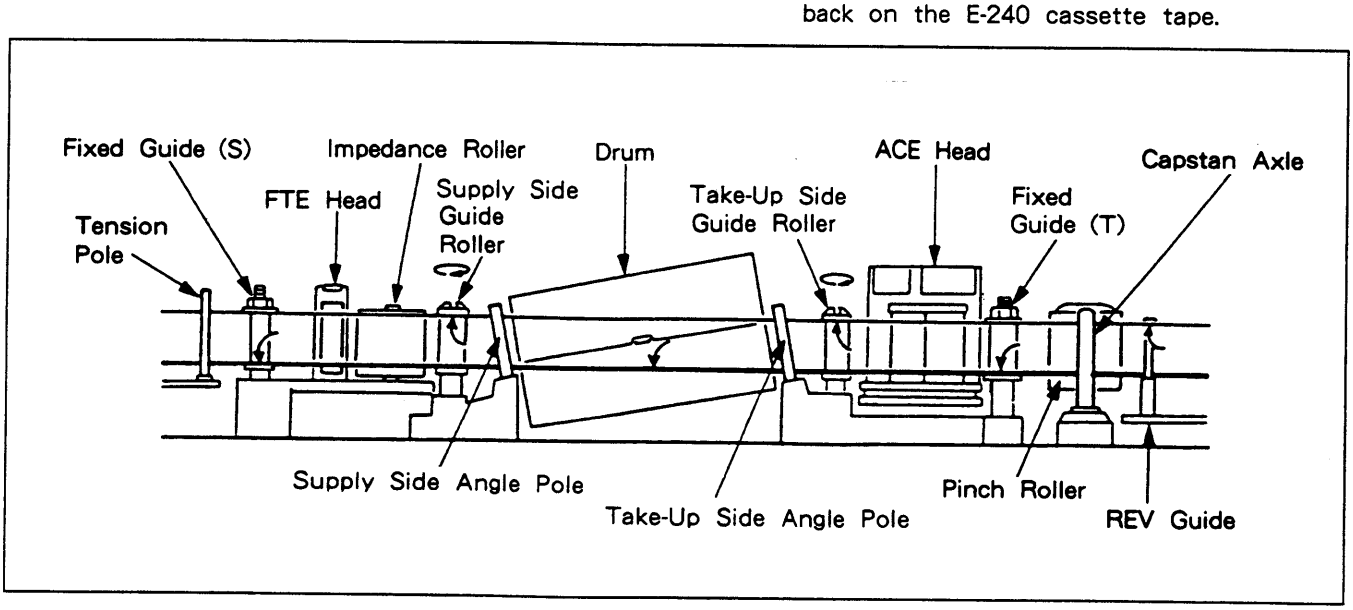


Fig. 4-4-10

Parts No. TP30036

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June/93/160 S Printed in Japan

MM531233